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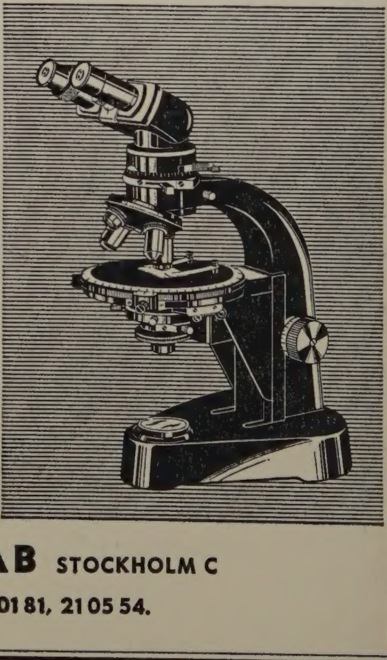

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GEOLOGISKA FÖRENINGENS
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Age Determinations of Swedish Precambrian Rocks

By

NILS H. MAGNUSSON

Introduction

The Geological Survey of Sweden has, as a special concession, got a number of absolute age determinations made at two geological institutes in the Soviet Union. Most of them have been carried out at the Laboratory for Precambrian Geology of the Academy of Science of the USSR in Leningrad. The Director of this Laboratory is Academician A. A. Polkanov. The determinations have been done by professor E. K. Gerling. Complementary determinations have been made by Academician N. P. Semenenko, at his institute in Kiev.

These determinations have already been used by the author in the "Description to accompany the map of the prequaternary rocks of Sweden" (SGU Ba No 16). In this description, however, the determinations for the stratigraphic groups have been dealt with and discussed only very shortly. It seems therefore suitable to publish all the determinations obtained at present and to add the author's explanations and reflections, and also his desiderata concerning additional, complementary determinations.

The determinations are made according to the Potassium 40/Argon 40 method. Only in two cases determinations have been made also according to the Rubidium 87/Strontium 87 method. These will be mentioned later on. In the following table the determinations have been arranged according to their age, beginning with the youngest rocks. In addition the numbers in the journal of the Leningrad Laboratory are given in parantheses.

Table I.

1. (1257) 559 m. y. Red sparagmite. Dajkanvik, W of Storuman, Västerbotten.
2. (1318) 920 m. y. Bohus granite. N of Lysekil, Bohuslän.
3. (1216) 940 m. y. Mica quartzite E of Borås, Västergötland.
4. (1246) 968 m. y. Augen gneiss. E of Göteborg, Västergötland.
5. (1234) 992 m. y. Gneiss granite. NE of Karlstad, Värmland.
6. (1215) 1005 m. y. Red gneiss. NNW of Forshaga, Värmland.

7. (1236) 1010 m. y. Bohus granite, N of Lysekil, Bohuslän.
8. (1217) 1012 m. y. Fjärås gneiss. E of Kungsbacka, Halland.
9. (1244) 1030 m. y. Red gneiss, E of Borås, Västergötland.
10. (1255) 1040 m. y. Mica schist, E of Marstrand, Bohuslän.
11. (1218) 1056 m. y. Grey banded gneiss.
    1068 m. y. NW of St. Kil, Värmland.
12. (1265) 1060 m. y. Filipstad granite. N of Karlskoga, Värmland.
13. (1224) 1065 m. y. Kroppefjäll granite. S of Mellerud, Dalsland.
14. (1254) 1066 m. y. Mica schist. E of Marstrand, Bohuslän.
15. (1238) 1082 m. y. Åmål granite. SW of Säffle, Värmland.
16. (1233) 1120 m. y. Askim granite. S of
    1135 m. y. Göteborg, Västergötland.
17. (1256) 1185 m. y. Dala sandstone. NE of Orsa, Dalarna.
18. (1263) 1240 m. y. Mica quartzite. Västanå, N of Ivösjön, Skåne.
19. (1220) 1260 m. y. Filipstad granite. NW
    1270 m. y. of Fjugesta, Närke.
20. (1307) 1270 m. y. Vaggeryd syenite. E of Vaggeryd, Småland.
21. (1232) 1420 m. y. Karlshamn granite. W
    1420 m. y. of Holmsjö, Blekinge.
22. (1245) 1460 m. y. Tving granite. ESE of Rödeby, Blekinge.
23. (1242) 1475 m. y. Småland granite. NW of Torsås, Småland.
24. (1325) 1500 m. y. Mica schist. Åtvidaberg, Östergötland.
25. (1326) 1530 m. y. Mica schist. Åtvidaberg, Östergötland.
26. (1319) 1540 m. y. Lina granite. WNW of Malmberget, Norrbotten.
27. (1268) 1560 m. y. Coast gneiss. NW of Karlskrona, Blekinge.
28. (1271) 1560 m. y. Gneiss-granite. ESE of Virserum, Småland.
29. (1214) 1620 m. y. Askersund granite.
    1680 m. y. WSW of Askersund, Närke.
30. (1259) 1640 m. y. Mica schist. Ställdalen, Västmanland.
31. (1235) 1660 m. y. Augen granite. ENE of Gryt, Östergötland.
32. (1320) 1680 m. y. Mica schist. SE of Östavall, Medelpad.
33. (1222) 1700 m. y. Mica schist. S of Odensbacken, Närke.
34. (1223) 1700 m. y. Grey granite geniss. SE of Katrineholm, Södermanland.
35. (1308) 1700 m. y. Haparanda granite. E of Neder-Kalix, Norrbotten.
36. (1309) 1705 m. y. Revsund granite. W of Dorotea, Västerbotten.
37. (1270) 1710 m. y. Porphyritic Jörn granite. NNW of Jörn, Västerbotten.
38. (1258) 1730 m. y. Slate. NW of Los, Hälsingland.
39. (1237) 1740 m. y. Augen granite-gneiss. NE of Ljusdal, Hälsingland.
40. (1223) 1750 m. y. Småland granite. NNW of Vimmerby, Småland.
41. (1266) 1750 m. y. Red biotite granite. NE of Norberg, Västmanland.
42. (1247) 1760 m. y. Stockholm granite. Svartsjölandet, W of Stockholm, Uppland.
43. (1241) 1770 m. y. Revsund granite. Bräcke, Jämtland.
44. (1310) 1770 m. y. Haparanda granite. NW of Luleå, Norrbotten.
45. (1239) 1780 m. y. Garnet gneiss. NE of Sparreholm, Södermanland.
46. (1212) 1800 m. y. Fellingsbro granite. ESE of Nora, Västmanland.
47. (1264) 1830 m. y. Härnö granite. Hemsö, NE of Härnösand, Ångermanland.
48. (1221) 1830 m. y. Sala granite. E of Sala, Västmanland.
49. (1249) 1850 m. y. Hedesunda granite, Hedesunda, Gästrikland.
50. (1267) 1850 m. y. Grey Jörn granite. Jörn, Västerbotten.
51. (1269) 1850 m. y. Rätan granite. W o Kårböle, Hälsingland.
52. (1240) 1860 m. y. Järna granite. Dala-
    1880 m. y. Järna, Dalarna.
53. (1248) 1950 m. y. Uppsala granite. Upp-
    1950 m. y. sala, Uppland.

Rubidium 87/Strontium 87 determinations have been made of Nos 23 and 52. The former gave 1 430 m.y., the latter 1 940 m.y. The Potassium 40/Argon 40 method gave 1 475 m.y. for the former and 1 860—1 880 m.y. for the latter.

1958 Academician Semenenko, when visiting Stockholm, asked for samples of Precambrian schists in order to make age determinations of them according to the Potassium 40/Argon 40 method. On the same samples Polkanov and Gerling have made complementary determinations according to the same method.

Semenenko's and Polkanov—Gerling's results are given in the following table. The numbers in the journal of the Leningrad Laboratory are given in parantheses.

Table II.

	Polkanov-Gerling	Semenenko	
54. (978)	964 m. y.	848 m. y. 904 m. y.	Slate. Almesåkra series, Småland.
55. (973)	985 m. y.	1060 m. y.	Shale. Visingsö series, Småland.
56. (976)	1025 m. y.	1030 m. y. 1100 m. y.	Slate. Dalsland series, Dalsland.
57. (972)	1275 m. y. 1285 m. y.	1348 m. y. 1380 m. y.	Slate. Saxå field, Värmland.
58. (975)	1380 m. y.	1400 m. y. 1450 m. y.	Slate. Grythytte field, Västmanland.
59. (974)	1730 m. y.	1700 m. y. 1760 m. y.	Mica schist. Utö, Södermanland.
60. (979)	2090 m. y. 2140 m. y.	2180 m. y.	Slate. Skellefte field, Västerbotten.

The Relations between the Svecofennian and Karelian Cycles

In the American Journal of Science Gordon Gastil has in January 1960 published a paper about "The Distribution of Mineral Dates in Time and Space". Among his intervals of date abundance the following are of special interest for Sweden, namely 1 860 to 1 650 million years (m.y.) 1 480 to 1 300 m.y. and 1 100 to 930 m.y. The first interval corresponds to the Karelian and Svecofennian (or Svionian) in Sweden. Most of the age determinations of rocks from these cycles occur in this interval. The same is the case also for the eastern part of the Baltic shield according to the determinations made by Finnish and Russian investigators.

The most interesting is that the Karelian and the Svecofennian rocks have given the same dates. Both in Finland and in northernmost Sweden the geologists have distinguished between two cycles, an older Svecofennian (or Svionian) and a younger Karelian cycle. Owing to the similarity of the age data several Finnish geologists and above all A. Simonen and A. Metzger have come to the conclusion that the Karelian and the Svecofennian are not two cycles different in time but two different zones in the same cycle.

According to the opinion of Metzger expressed in a paper about "Svekofenniden und Kareliden" the Karelides and the Svecofennides are "ebenbürtige

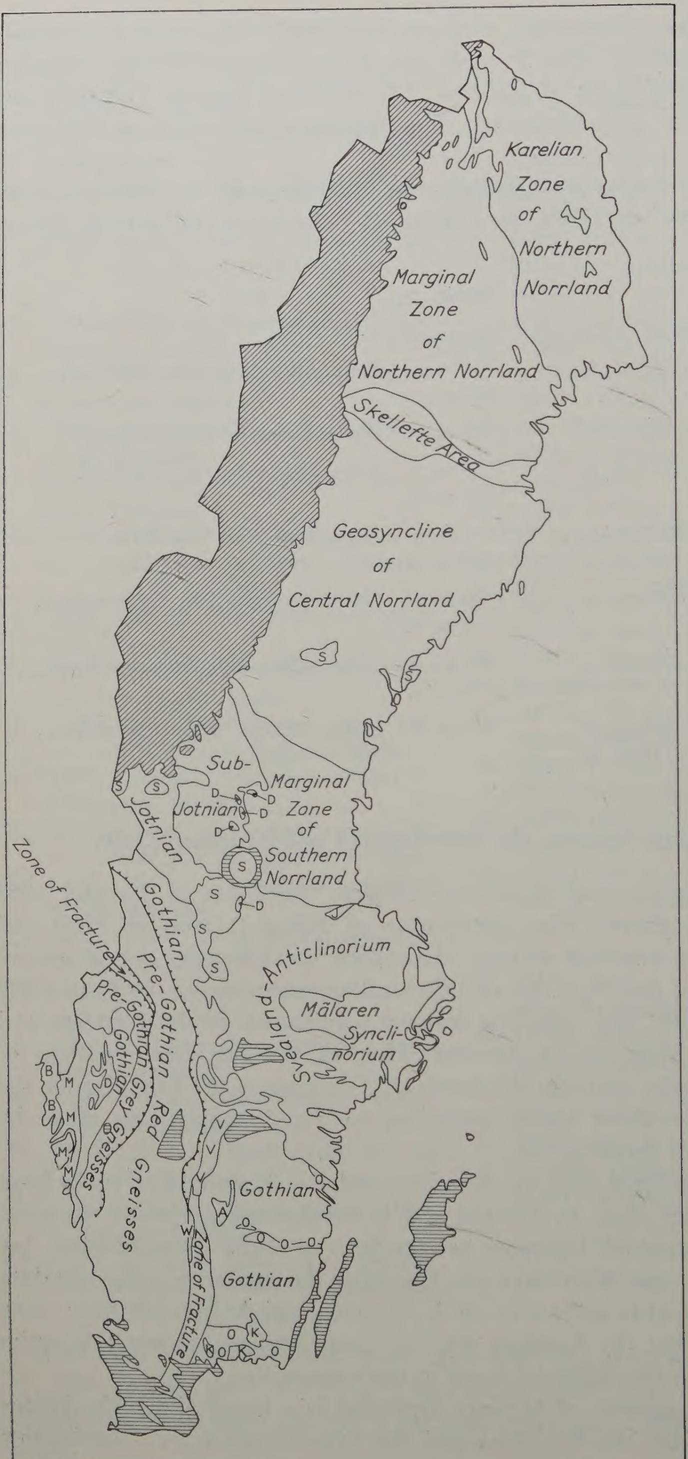
Karelian Zone of Northern Norrland
Marginal Zone of Northern Norrland
Skellefte Area
Geosyncline of Central Norrland
S
Sub-Jotnian
Marginal Zone of Southern Norrland
D
Jotnian
Zone of Fracture
Gothian
Pre-Gothian Red Gneisses
Pre-Gothian Grey Gneisses
Svealand-Anticlinorium
Mälaren Synclinorium
B
M
V
A
W
O
K
Gothian
Zone of Fracture

Fig. 1. Map of the tectonic zones and regions of the Precambrian of Sweden. — B: Bohus granite, M: Stora LeMarstrand series, D: Dalslandian, V: Visingsö series, A: Almesåkra series, K: Karlshamn granite, O: Old Gothian, S: smaller areas of Subjotnian, W: Vaggeryd syenite, J: smaller areas of jotnian. From N. H. Magnusson: The stratigraphy of the Pre-Cambrian of Sweden outside the Caledonian mountains 1960.

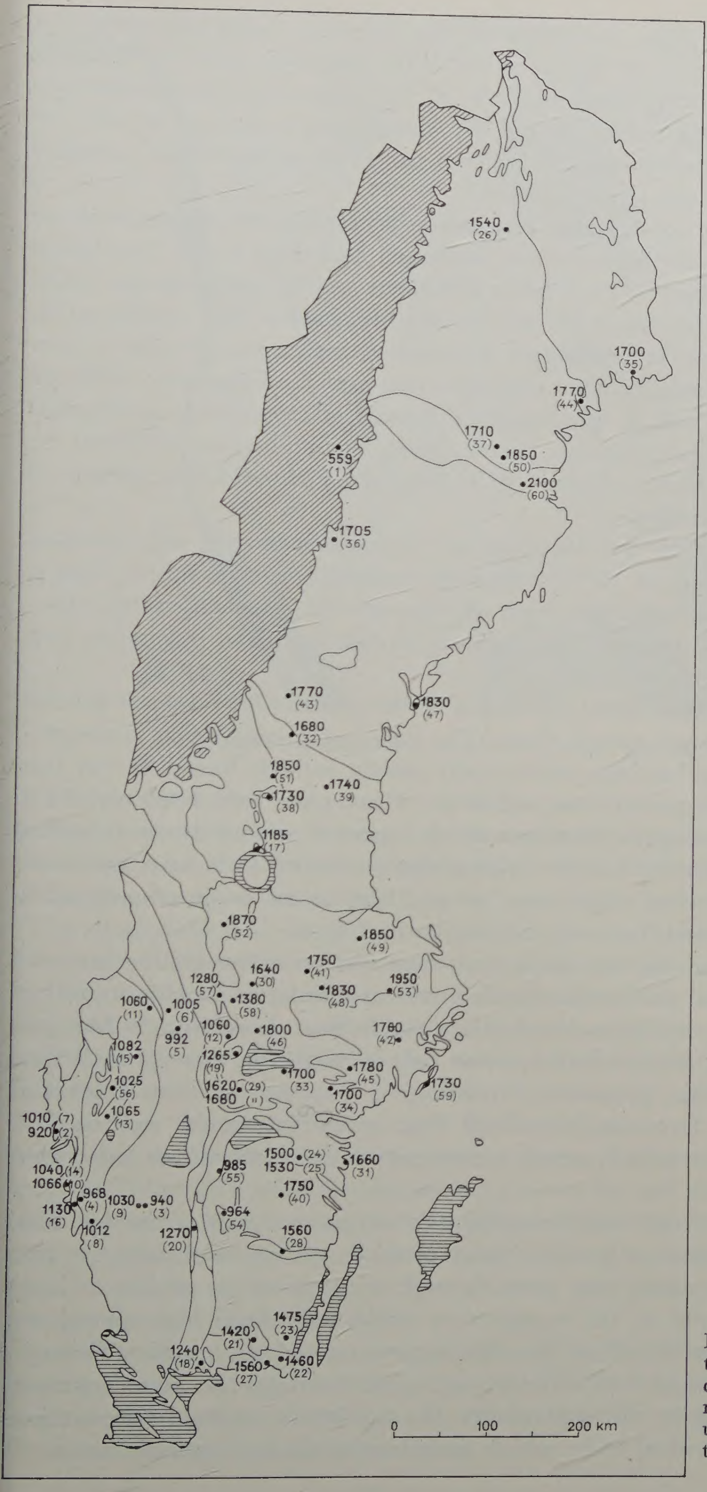

Fig. 2. Age determinations of Swedish Precambrian. The ages in million years. The figures in parantheses are the numbers in the tables.

Bildungen". The Jatulian sediments of the Karelian, being epicontinental formations, the sediments of the Svecofennides on the other hand belonging to the geosynclinal evolution. Metzger is also of the opinion that there exists only one serorogenic granite in Finland and that this granite is common to both the Karelides and the Svecofennides. It is therefore not according to him necessary to assume more than one orogeny.

Simonen has come to the same conclusions concerning the Precambrian of Finland. He divides the Svecofennian sediments into three series. The lowest of these is characterized by greywackes and slates and by quartz-felspar rocks. He correlates these in time with the Jatulian sediments. The middle series, characterized by basic volcanics and intercalated sedimentary rocks, he correlates with the Kalevian argillaceous sediments and the Lapponian with the same sediments but rich in intercalations of basic volcanics and quartz-sandstones. The Upper Svecofennian characterized by argillaceous sediments he correlates with the Kumpu formation in Northern Finland which consists of arkoses and conglomerates.

Younger than all these Svecofennian and Karelian sediments and volcanics, according to Simonen, is the synkinematic regional metamorphism. This is combined with magmatic intrusions of granodiorites, trondhjemites, charnockites and granites proper. Then follows the late-kinematic migmatites and granitizations.

Similar points of view about the origin of the granites have been expressed by Metzger in the paper named above. The sial-crust pressed down in connection with the folding has been anatectically mobile and has forced its way upwards, melting large parts of the sediments. These parts have been mobilized in the form of primorogenic intrusions which appeared as domes or as irregular masses which in connection with migmatitization forced their ways upwards. The differentiation after weight went on and lead to the origin of pegmatitic microcline granites and their regional migmatite fronts.

Thus Simonen and Metzger think that there was no sedimentation between the synkinematic and the late-kinematic granites. The latter should, according to them, have followed immediately after the former. According to Metzger the late-kinematic granites which are very rich in microcline were preceded by potassium-metasomatic processes. According to Simonen the late-kinematic microcline granites have not crystallized from a residual granite magma, but hydrothermal processes and potash metasomatism have played an important role in their origin.

P. Eskola has declared that the explanation of the similarity of the age data discussed could be quite otherwise. There could be two cycles different in age which have at the same time gone through a regeneration process at high temperature. The rise of the temperature might have been high enough to drive out the Argon 40. Then the disintegration could start again. Through this regenation rocks of very different age could have got the same apparent age. It is, according to this explanation, the age of the regional regeneration and not of the individual rocks, which are given by the age determinations.

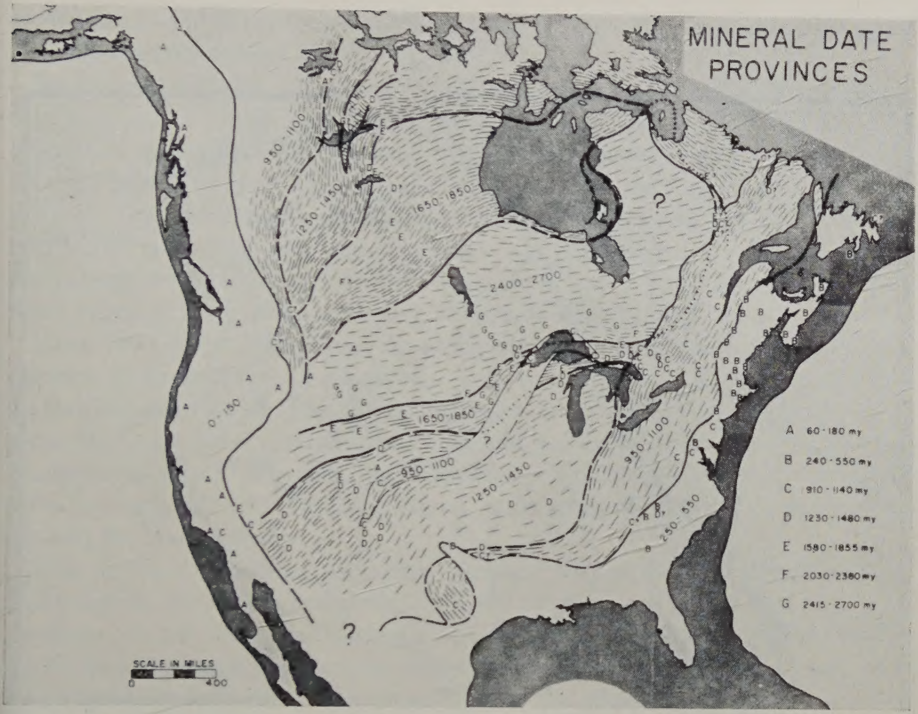

Fig. 3. From G. Gastil: Continents and mobile belts in the light of mineral dating. 1960.

The present author had come to the same conclusion as Eskola already when he had received the first fourteen age determinations from Leningrad. This is clear from a paper written in January this year and published in "Precedings of the International Geological Congress", section 9. The paper had the title: "The Stratigraphy of the Pre-Cambrian of Sweden outside the Caledonian Mountains." The existence of two such regeneration processes seemed already at that time to be established: the Svecofennian—Karelian at about 1 800 m.y. and the Pregothian—Gothian—Dalslandian at about 1 000 m.y. Behind both these in time widely separated revolutionary periods there were, as the field observations have shown, long and complicated geological evolutions.

Regarding the Svecofennian cycle the investigations of G. Kautsky have shown that the development of the synkinematic granites in the Skellefte field occurred before the sedimentation of the greywackes and slates in the geosyncline of Central Norrland south of the Skellefte field. The Vargfors and Mensträsk conglomerates are the bottom layers of the geosynclinal sediments and contain pebbles of the synkinematic granites, the Jörn granites, which are younger than the Maurliden series.

In the northern part of the marginal zone of southern Norrland the Naggen quartzite series corresponds stratigraphically to the Vargfors and Mensträsk conglomerates and is according to P. H. Lundegårdh younger than the synkinematic granites of this marginal zone.

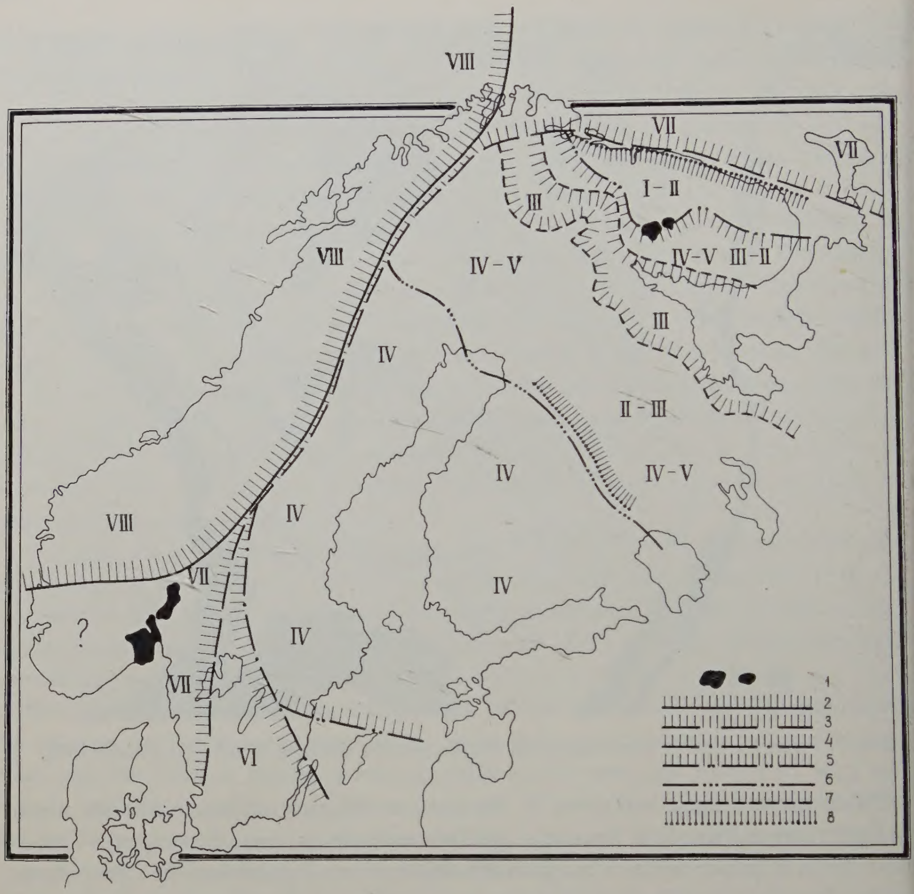

Fig. 4. The Baltic Shield. The schematic geochronological division of the pre-Cambrian. I. The Palaeozoic healkaline intrusions. 2. The boundary of Caledonides (The shade is directed inside of the folded belt). VIII The Caledonides. 3. The boundary of Ripheides. VII The Ripheides. 4. The boundary of Gothides. VI. The Gothides 5. The boundary of Svecofennides-Karelides. IV. The Svecofennides. IV—V. U. and L. Karelides. 6. The boundary between the Svecofennides (IV) and the Karelides (IV—V). 7. The boundary of the Intermontanes of Belomorides. III. The Belomorides. 8. The boundary of Saamides. II. The Saamides. I. The Katarchean. From A. A. Polkanov and E. K. Gerling: The Precambrian geochronology of the Baltic shield. 1960.

The author had earlier (in the second edition of "Sveriges geologi", 1949) tried to explain the disappearance of these old granites in the northernmost part of the marginal zone of southern Norrland by assuming an overthrust zone within which the substratum rich in such granites had been pressed over the geosynclinal sediments in the north. Through the investigations of Lundegårdh the problem has a more elegant solution. The question about the overthrust zone is not, therefore, removed from the coming discussions. The essential thing just now is that the oldest folding both here and in the Skellefte field is older than the geosynclinal sedimentation. In the third edition of "Sveriges geologi" (1957) the author therefore proposed the term Late Svionian or Late

Svecofennian for the sediments younger than the first Svecofennian folding and its synkinematic granites.

In Central Sweden, that is the Svealand Anticlinorium and the Mälaren Synclinorium, investigations during the last 40 years have made it quite clear that the supracrustal rocks are older than the first folding and the development of the oldest granites. That is valid for both the volcanic rocks with their intercalations of carbonate rocks and iron ores and for the Grythytte, Larsbo and Mälar series. It is also quite clear that this first folding was followed by an intra-orogenic period characterized by a great many fissures and of diabase dikes intruded along them and later altered to amphibolites.

After this surely long interval the palingenic processes began through regional increase of temperature in connection with orogenic or epeirogenic movements and a flow of material from the deeper parts of the earth's crust into its upper parts. Through these metasomatic alterations combined with metamorphic differentiations inside the rocks there originated veined gneisses with concentrations of pegmatitic and granitic material inside them and granites rich in microcline in the roof of them.

The problem is if these palingenic processes within the Svealand Anticlinorium and in the Mälaren Synclinorium are of the same age as the palingenic processes within the broad Geosyncline of Central Norrland. The palingenic processes have in the latter region altered most of the greywacke-slate sediments into veined gneisses contemporaneously with the development of granites rich in microcline which occupy nearly half of the geosynclinal zone. What can be said at present is that no field observations have yet been made in the regions between the Svealand Anticlinorium and the Geosyncline of Central Norrland indicating two different palingenic processes in the Svecofennian region south of the Skellefte field. The age determinations also indicate the same age.

Concerning the relations between the Svecofennian and the Karelian cycles in northern Sweden O. Ödman and his collaborators, especially T. Eriksson, have reported several field occurrences where the Karelian evolution is seen to be distinctly younger than the Svecofennian. Karelian conglomerate exists even with boulders of probably Svecofennian veined gneisses. The age determinations made during the last years on rocks from Sweden, Finland and the Soviet Union have, however, as has been mentioned before, given about 1 700—1 800 million years for both the Karelian and the Svecofennian rocks. There are, as the author has pointed out, essentially two explanations for these apparently contradictory facts. The first is that these cycles have been very near each other in time. The palingenic processes in late Karelian time in such a case must have followed upon the palingenic processes in the Late Svionian so nearly that the time that elapsed between the two must have been smaller than the errors of the methods used. The second, the most probable, is that a widespread regeneration has occurred both in the Karelian and in the Svecofennian rocks in connection with a regional sinking of both regions in late Karelian time.

The Karelian Zone and the Marginal Zone of Northern Norrland

(Including the Skellefte Field)

The most important problem in Northern Sweden is here the relations between the late Karelian Lina granite and the late Svecofennian Revsund granite. Unfortunately there exists only one age determination for the former on a specimen taken westnorthwest of Malmberget and this has given 1 540 m.y. This surprisingly low figure can scarcely be characteristic for the extensive areas of rocks belonging to the Lina granite group, if the results in Finland and the Soviet Union are taken into consideration. A younger granite of this age can naturally exist locally. It is therefore an urgent need to have several determinations on specimens spread out over the Lina granite area and over the areas of the anorogenic granites appearing in the same region and also of the veined gneisses, which according to Ödman and his collaborators are associated in time with the Lina granite group.

No age determinations exist of the supracrustal Karelian rocks, and it is desirable that specimens be taken from the region between Kiruna and Kaunisvaara.

The Haparanda granite is according to the new "Map of the Pre-Cambrian Rocks of the Norrbotten County", younger than the Lapponian rocks. Of this granite two age determinations have given 1 700 and 1 770 m.y., that is about the same age as the Svecofennian synkinematic Jörn granite of which two specimens have been dated at 1 850 and 1 710 m.y. The latter determination may however according to the author be of a Revsund granite appearing within the Jörn granite massif.

Of the sediments in the Skellefte field only a black slate has been determined. The specimen gave 2 140—2 090 m.y. according to Polkanov and Gerling and 2 180 according to Semenenko. Polkanov and Gerling class this slate as Belomorian, for which period they give the interval between 2 100 and 1 950 m.y. The slate specimen in question is taken from an area with well preserved rocks. If this determination is correct it could indicate that the sediments are essentially older than the palingenic processes which "regenerated" the rocks in the surrounding regions. It is therefore desirable that the Skellefte field be subjected to geochronological determinations, especially of sediments from the late Svecofennian Elvaberg series and the older Maurliden series. In this region granites assigned to the Karelian cycle meet granites of the Svecofennian cycle. As suitable objects for age determinations the following granites may be mentioned: the Adak granite, the Sorsele granite, the Revsund granite and the red granites of the Adak type within the Revsund granite area, according to S. Gavelin on the map of the Västerbotten county, printed in 1955.

The Geosyncline of Central Norrland and the Marginal Zone of Southern Norrland

For the Geosyncline of Central Norrland only three determinations have been made. Two of them are of Revsund granites. They have given 1 700 and 1 750 m.y. The third specimen, of a muscovite granite, the Härnö granite, has given 1 830 m.y. Important should be to get several age determinations both of the relatively well preserved greywacke-slate sediments of the Härnö series in the Västernorrland County and of these sediments altered to veined gneisses. Of greatest interest would be determinations of the Subjotnian rocks in the Ragunda massif and in the Nordingrå region in the same county. These rocks have usually been correlated with the Finnish Rapakivi granites. These granites are now of both Finnish and Russian geologists considered as late anorogenic intrusives of the Svecofennian-Karelian evolution. The age of the Rapakivi granites is according to Simonen 1 640 m.y.

For the Marginal zone of Southern Norrland only two determinations have been made, one of a well preserved quartzite-schist belonging to the Naggen quartzite series and one of a gneissic augen-granite of a type usual in the northern part of Hälsingland. The quartzite-schist has given an age of 1 680 m.y. and the augen-granite 1 740 m.y. Nearly the same age, 1 730 m.y. was given by a slate from the Los region, according to H. von Eckermann belonging to his Upper Los series. Through the investigations of Lundegårdh it has been clear that the two lower series in the Los-Hamra region, the Sub-Los and the Lower Los series, which of von Eckermann were considered as Gothian and younger than the late Svecofennian palingenic processes, instead are older than these processes and thus belong to the Svecofennian rocks. The Upper Los and the Noppi series are however still considered to be younger.

On the new map of Sweden these two series hage got the same colour as the Dalslandian sediments. S. Hjelmqvist has expressed no opinion about this correlation but considers these series to be nearly connected with the Subjotnian Dala porphyries but somewhat older than them. He calls these series the Lower Dala series and the Dala porphyries the Upper Dala series. It is therefore at first glance peculiar that the investigated schist from the Upper Los series has given so high a figure as 1 730 m.y. The explanation may however be that this figure is not the figure of the rock but of the mica-material in the rock. This mica must have been taken from the neighbouring Svecofennian rocks.

More difficult is to get a valid explanation for the high age date given by the only examined specimen of the Rätan granite and taken near the eastern boundary against the Svecofennian rocks. According to von Eckermann this granite is younger than the Upper Los and the Noppi series and according to S. Hjelmqvist younger than the Subjotnian Dala porphyries. The age determination have given 1 850 m.y. The author will return to this problem when discussing the problems of the Jotnian and Subjotnian rocks. It is important however to get determinations also of specimens from the central and western part of the large Rätan granite area. It is also important to get more determinations of sediments from the Upper Los and the Noppi series.

The Mälaren Synclinorium and the Svealand Anticlinorium

Within the Mälaren Synclinorium and the surrounding Svealand Anticlinorium many rock specimens have been chosen for age determinations.

The rocks in the Mälaren Synclinorium are to a great extent altered to veined gneisses. This alteration has also, in the south and southwest, gone out over the boundaries of the synclinorium. The determinations made on five specimens from this region south of Lake Mälaren and Lake Hjälmaren have given very similar results. A muscovite schist south of Odensbacken, Närke has given 1 700 m.y., a veined gneiss rich in garnet northeast of Sparreholm 1 780 m.y., a quartzitic schist from northern Utö 1 730 m.y., an old synkinematic granite altered to veined gneiss, southeast of Katrineholm 1 700 m.y., and a Stockholm granite, west of Stockholm, 1 760 m.y. These conformable figures indicate that 1 700—1 780 m.y. is the real age of the palingenic processes that altered varying rocks into veined gneisses and also the age of the Stockholm granite appearing in the area of the veined gneisses.

Within the better preserved parts of the Svealand Anticlinorium north of lake Mälaren three age determinations have been made of old Svecofennian synkinematic granites. The basic Uppsala granite from the town of Uppsala has given 1 950 m.y., the more salic Sala granite from the region east of Sala, 1 830 m.y. and the red, microcline granite east of Norberg 1 750 m.y. If this reflects the real differences of age is uncertain. It is, however, remarkable that the regional mapping of the old synkinematic granites indicates that as a rule the basic granites are the oldest and the granites rich in quartz and microcline the youngest. More determinations must naturally be made to make it clear if it is coincidence or not. Noteworthy is the fact that Polkanov and Gerling as a result of the high age figure for the Uppsala granite have reckoned this granite to the Belomorian. As the Uppsala granite is younger than the neighbouring supracrustal rocks these rocks ought to be still older and if our present opinions of the stratigraphy in the iron-ore-bearing region of Central Sweden are correct, the Svecofennian supracrustal rocks should be at least 2 000 m.y. and thus Belomorian according to the Russian terminology.

In the western part of the Svealand Anticlinorium the greywackes and slates of the Grythytte series appear in several isolated synclines. The uniform stratigraphy in these synclines and below them indicates distinctly that these now isolated greywacke-slate occurrences are pieces of originally the same sediment layers. In spite of this the Ställdalen slate gave 1 640 m.y., the Grythytte slate 1 380 m.y. and the Saxå slate 1 280 m.y. Higher and more uniform ages might have been expected. As is apparent the age for the Saxå field, which is situated nearest the Gothian Värmland granites, is lower than the figure for the Grythytte field and the age highest for the Ställdalen field, which is situated farthest from the named granites.

It is most probable that the Gothian granites have, by raising the temperature, caused a regeneration. The Värmland granites are besides cut by steeply dipping schistosity planes and often crushed and mylonitized in the vicinity of these planes. The same movements have also influenced the Svecofennian rocks east of the Värmland granites. Both these processes may have lowered the amount of Argon. This is to be considered as an excellent example showing how necessary it is to know a good deal about the geological situation before trying to judge the value of an age determination. Polkanov and Gerling reckon the Saxå and Grythytte slates to the Gothian cycle despite the geological evidence which so clearly indicates a Svecofennian age.

In the western and the northern parts of the Svealand Anticlinorium there appear a great many rounded massifs of younger granites rich in quartz and microcline and accompanied by an abundance of pegmatites and aplites. Well known among these granites are the coarse, red grey to red Fellingsbro granite and the grey to red-grey fine medium- to fine-grained Stockholm granite. These are nearly related to the granites in the area of the veined gneisses in the region south of Lake Mälaren. The author therefore will explain these granites as domeshaped concentrations of materials coming from an underlying zone of veined gneisses. This material has fused or assimilated the older rocks, whose place they have taken. It is of great interest to note that the two determinations made on such granites have given so high figures as 1 800 and 1 850 m.y., the former for the Fellingsbro granite east-south-east of the town of Nora, the latter of the Hedesunda granite, south of Gävle. A possible explanation is that the temperature was essentially lower in the roof of the veined gneisses where the intrusions of these granites occurred and that the palingenic processes that formed the veined gneisses continued a long time after these intrusions.

1954 A. Parwel and F. E. Wickman published some preliminary results of age determinations on Swedish pegmatite minerals. Uranium, thorium and lead determinations were made on some radioactive minerals. The result indicates that the pegmatites in the Svecofennian areas of Stockholm and Falun are about 1 800 m.y. This result corresponds very well with the determinations according to the Potassium 40/Argon 40 method. The peak of mineral date abundance in Sweden for the determinations in the Svecofennian-Karelian area of Sweden is about 1 750 m.y.

The Gothian Rocks of Southeastern Sweden

When the author 1936 worked out his Prequaternary geological history of Sweden for the first edition of "Sveriges geologi" he followed W. Wahl as regards the age relations between the Karelian and the Gothian cycles. The same idea was expressed in the second edition (1949). It was in the first instance the relations between the Gothian rocks in southwestern Sweden and the Dalsland series that were conclusive for the author's attitude to the problem. Excursions in Finland had given the author the same impression as for instance B. Asklund that the Dalsland series has so many features common to the Jatulian sediments in the Finnish Karelides that there were good reasons for correlating them. The author therefore at this time reckoned the Dalsland series to the Karelian cycle and as the Dalsland series was deposited on a land surface in which Gothian granites dominated, the author came to the conclusion that the Karelian cycle was younger than the Gothian.

Excursions in the Norrbotten county in the beginning of the fifties, however, convinced the author that the Lapponian rocks of this county have so many special characteristics in contrast to the rocks of the Dalsland series that they can scarcely be correlated with them. The author therefore retained the term Dalslandian used by J. J. Sederholm 1932. To the Dalslandian the author in the third edition of "Sveriges geologi" referred not only the Dalsland series but also some smaller, isolated areas in Central Sweden.

To separate the Dalsland series in this way from the Karelian sediments has now been shown to be a good solution of the problem. The age determinations indicate namely that the Gothian rocks are younger than both the Svecofennian and the Karelian rocks and as the Dalslandian sediments are younger than the Gothian they must be much younger than the Karelian.

Besides a great many field observations speak for the opinion that the Gothian rocks are younger than the Svecofennian as the author has repeatedly pointed out. The Karelian rocks are so far away from the Gothian in southern and central Sweden that only the age determinations could solve the problem concerning the age relations between the two cycles. H. G. Backlund (1936) correlated them and spoke of one cycle which he called the Gotho-Karelian. The new age determinations now show how misleading this term was.

With the exception of the age determination of one granite taken near the county boundary north-north-west of Vimmerby, that has given 1 750 m.y., all Gothian rocks east of Lake Vättern and east of the schistosity zone from Vättern southwards into Scania are younger than 1 660 m.y. Unfortunately there are for the northern part of this large area as also for the area between the northern end of Lake Vättern and Lake Skagern too few determinations. The boundary zone between Gothian and Svecofennian from Skagern to the region on the eastern coast between Norrköping and Loftahammar is very complicated with an irregular distribution of Gothian and Svecofennian rocks. Massifs of Gothian granites appear in the latter relatively far from the large Gothian granite area and in this area a great many remnants of older rocks of different kinds appear, as the author has shown for the map sheets Mjölby and Strålsnäs and N. Sundius for the map-sheet Åtvidaberg. It is therefore not surprising that the granite north-north-west of Vimmerby has given 1 750 m.y. The Askersund granite has given 1 650 m.y. and an augen-granite east of Valdemarsvik 1 660 m.y.

It is necessary to pick out a relatively large number of specimens from this northern part of the southeastern Gothian area for complementary age determinations before discussing in some detail the problems of the region. The author will propose determinations on the Västervik quartzite series and the Loftahammar granite as a contribution to the solution of the relations of this granite to the quartzite in the south and to the veined gneisses in the north, further determinations of Gothian granites from the Mjölby region, the area between Överum and Åtvidaberg, the Tranås area, the area north of Roxen, the Graverfors massif and a new specimen of typical Askersund granite. It should also be of great interest to get an age determination of a specimen of the Risten granite, south of Ringstorp, which is considered to be older than the Gothian rocks.

The Gothian augen-granites of the boundary zone with the Svecofennian rocks in the Svealand Anticlinorium often pass into gneissic rocks with augen quite similar to those in the real granites. The augen successively disappear in the surrounding gneissic Svecofennian rocks. The author has explained these rocks as roots beneath the Gothian granites for granitic material seeking its way upwards. The micas in these augen-gneisses are certainly old Svecofennian micas. The problem is to what extent the micas of the rocks with a granitic appearance in the complicated boundary zone in question are old micas.

A specimen of the gneiss-granite east of Virserum, in the zone from Vetlanda to Oskarshamn, has given 1 560 m.y. This gneiss-granite is probably the basement for the Vetlanda series. It is of great interest that the mica schist in the Åtvidaberg field has given nearly the same age data, 1 530 m.y., and that the coast gneiss in Blekinge on a specimen taken northwest of Karlskrona has given 1 560 m.y. For eastern Blekinge and southeastern Småland three more determinations have been made. The Tving granite northeast of Karlskrona has given 1 460 m.y., the Gothian granite west-north-west of Torsås 1 475 m.y., and the Karlshamn granite in the large massif situated on both sides of the boundary between Blekinge and Småland 1 420 m.y.

If no regeneration process has occurred in eastern Blekinge and southeasternmost Småland the whole evolution from the oldest rocks, the coast gneisses, to the youngest, the Karlshamn granites, took place in an interval of 150 m.y. As the Karlshamn granites probably are the upper dome-shaped offshoots from an underlying palingenic zone, it is possible that also a regeneration took place in connection with the development of the porphyritic Karlshamn granites and their even-grained and fine-grained companions, the Spinkemåla and Halen granites. The Tving granites are more schistose and gneissic than the Gothian granites in the north. This can be the explanation of the somewhat lower age of the Tving granite in comparison with the Gothian granite.

The author has still in the third edition of "Sveriges geologi" placed the Karlshamn granite group side by side with the Dalslandian Bohus granite. The age determinations indicate, however, that this correlation is erroneous and that the Karlshamn granite instead is the final granite of the Gothian evolution in southeastern Sweden. The age determinations, available at present, indicate that the Gothian cycle proper falls between 1 660 and 1 420 m.y. Complementary determinations are desirable of Gothian granites from the central parts of the large Småland granite area, for instance the regions around Växjö, Åseda, and Nybro. Determinations ought also to be made on specimens from the Vetlanda series.

The Schistosity Zone through Southern Sweden

The Västanå series, northwest of Sölvesborg, is usually correlated with the Vetlanda and the Västervik series. An age determination of the Västanå series has given 1 240 m.y., a surprisingly low figure. It is however probable that this low figure depends upon the vicinity of the broad schistosity zone through Småland and Scania. North of Värnamo this zone goes through Gothian granites, south of this town through Pregothian gneisses. South of the southern end of Lake Vättern the schistosity planes bend towards the northwest and then runs parallel with the western shore of Vättern. On the new map of the Prequaternary rocks of Sweden the schistosity symbols have been drawn into the Tidaholm region. Schistosity planes cut, however, as has been mentioned before, the Gothian granites north of Tidaholm as well as in Värmland and neighbouring provinces.

Only a few age determinations exist for these more or less schistose rocks. South of Lake Vättern the Vaggeryd syenite has given an age of 1 270 m.y. The peculiar position of this syenite as a long and narrow intrusion at the western boundary of the schistosity zone against the Pregothian gneisses seems to indicate that the intrusion took place in connection with the tectonic movements along the schistosity planes. The Vaggeryd syenite is itself strongly influenced by these movements. It is therefore probable that the age of this rock also is the age of the schistosity. It is worth mentioning once more that the Västanå series (probably secondary) has nearly the same age.

For the Värmland granite area there exist only two age determinations, one of a relatively well preserved augen-granite from Kilsbergen northwest of Fjugesta and one of a strongly schistose granite north of the town of Karlskoga. The former has given 1 265 m.y., the latter 1 060 m.y. The author recalls the regeneration that has given the Saxå slate the age of 1 280 m.y. and the Grythytte slate 1 380 m.y.

The age determinations available at present are naturally hardly enough. If a conclusion can be drawn it is that the movements in the schistosity zone began about 1 300 m.y. ago and that movements continued, at least locally, to about 1 000 m.y. It is of the greatest interest to note that the 1 300 m.y. date very nearly corresponds to one of Gastil's "peaks of mineral date abundance", namely 1 330 m.y.

It is of great importance to get a number of age determinations of specimens from the schistosity zone and from the more or less schistose granites north of Lake Vättern. Suitable places for specimens are west of Filipstad, east of Kristinehamn, west of Karlsborg, west of Jönköping and southeast of Smålands Taberg. For comparison a specimen ought to be taken of the well preserved granite south of Huskvarna. Finally, an age determination of the intensively schistose and mylonitized granite south of Ödeshög would be very interesting, as the fault zone along the eastern shore of Lake Vättern may be younger than the schistosity zone west of Vättern. The age determinations of the latter have been discussed above.

The Pregothian, Gothian and Dalslandian Rocks of Southwestern Sweden

The author presented in the beginning of the thirties (1933) a proposal for dividing the oldest Precambrian rocks of Central Sweden into two cycles.

For the older cycle the author 1936 proposed the term Svionian, for the younger W. Wahl the same year proposed the term Gothian. The gneisses of southwestern Sweden were then considered to be highly metamorphic Gothian rocks originally of the same types as in southeastern Sweden. It was especially the increasing metamorphism towards west that could be studied in a profile from the region of Kristinehamn into the region of Karlstad and also the remnants of better preserved augen-granites that had been found in several places north of Lake Vänern. That seemed to indicate such a solution of the problem. These augen-granites, which very much resemble the Filipstad and Kristinehamn granites, have, however, for the author lost more and more of their significance since it has become apparent that similar granites occur in all differentiated granite series in southern Sweden of whatever age the series may be.

Through investigations in the twenties in the Gillberga syncline the author found that the Åmål series had been deposited on an old land surface, the rocks in which were altered to gneisses long before the deposition of this series. It was not only the structures of the rocks that were different on both sides of the land surface. The band- and lens-architecture with long and usually narrow bodies of different composition, which is so characteristic of the gneisses beneath the old land surface, are lacking above it. It was therefore quite clear that an older gneiss-forming process had occurred in southwestern Värmland.

As our knowledge of the rocks of southwestern Sweden has increased it has become more and more clear that the essential gneiss-forming processes are older than the Åmål series. It has also been quite clear, through mapping several areas in more detail, that the band- and lens-architecture characteristic of these old gneisses cannot have originated through metamorphism of a Gothian bedrock of the same type as in southeastern Sweden. On the other hand it has been shown that such rocks build up not only the Gillberga syncline but also its continuation towards the south into the Onsala peninsula south of Göteborg. The rocks in this long and relatively narrow syncline have also been marked as Gothian on the new map of Sweden. The gneisses between this syncline and the Gothian granites in the east have been identified as Pregothian. In "Sveriges geologi" (1957) they were designed as Old Gothian.

The gneisses appearing west of the Gothian syncline, west of Lake Vänern, belong to the Stora Le-Marstrand series. They include sedimentary gneisses and quartz-felspar rocks resembling the Svecofennian leptites in the Svealand Anticlinorium. This series is older than the rocks inside the Gothian syncline but younger than the Pregothian gneisses east of the syncline. On the new map of Sweden this series has been assigned to an older part of the Gothian. It is, however, possible that it can be of Svecofennian age. Between the Gothian rocks and the Dalslandian sediments in the Dalsland series there must have been a long period of denudation, as has been mentioned before. Finally the Bohus granite is younger than the Dalsland series. There is, therefore, a long and complicated evolution represented by the bedrock we can now study in southwestern Sweden. In spite of this fact the fourteen age determinations available at present all fall between 1 130 m.y. and 920 m.y. The Pregothian rocks have given the following figures: a granite-gneiss northeast of Karlstad 992 m.y., a red gneiss northwest of Forshaga 1 005 m.y., a grey banded gneiss northwest of St. Kil 1 060 m.y., a mica-rich quartzitic gneiss east of Borås 940 m.y., a red gneiss east of the same town 1 030 m.y., an augen-gneiss east of Göteborg 968 m.y., and the Fjärås gneiss southeast of the same town 1 012 m.y.

The Gothian rocks have given the following figures: an Åmål granite southwest of Säffle 1 082 m.y., a Kroppefjäll granite south of Mellerud 1 065 m.y., and an Askim granite from Göteborg 1 130 m.y. For the Stora Le-Marstrand series only two determinations has been made. They are of a mica schist from Tjuvkil, east of Marstrand, and have given 1 066 and 1 040 m.y. A slate from the Dalsland series has given 1 025 m.y.

Of a Bohus granite taken north of Lysekil two determinations gave respectively 920 m.y. and 1 010 m.y.

1954 A. Parwel and F. E. Wickman made uranium, thorium and lead determinations on radioactive minerals from southwestern Sweden. The result indicate that the pegmatites in this region are around 1 000 m.y. old. This resul corresponds very well with the age determinations given above.

The only possible explanation of the crowding of ages into a narrow interva seems to be the acceptance of a regeneration in Dalslandian time in connection with the development of the Bohus granites and their accompanying pegmatites. It is also probable that this regeneration took place in connection wit a regional sinking of the whole of southwestern Sweden, west of the schistosit zone, which divides southern Sweden into two parts with very differing geological histories.

The author has, in the "Description to accompany the map of the Pre quaternary rocks of Sweden", expressed his opinion as follows: "There hav been three intensive sinking periods in the history of southwestern Sweden During the first the pre-Gothian rocks were altered to gneisses. During th second the Gothian anorogenic granites were intruded and the Gothian rock altered for the first time. At the same time the existing gneissic pre-Gothia rocks were extensively recrystallized. Gothian and pre-Gothian complexes have therefore, in many regions where they border on each other, similar structure and grain size.

During the third period of sinking the Bohus granite developed, precede by intense tectonic movements. The Dalsland series was folded. This foldin was caused by a division of the Gothian basement into flat blocks which move relatively to each other. It was in connection with these movements that nappe of Gothian rocks were thrusted over the Dalslandian. The Dalsland series an the neighbouring rocks were at this time in the zone of fracture. The rocks at some distance to the north of the Dalsland series seem on the contrary to have been in the zone of flow, since the fracturing and displacement of thin sheetlike blocks disappear in this direction. In these outer zones, therefore, new palingenic processes took place and similar processes have surely taken place here and there in the Gothian and pre-Gothian rocks of Southern Sweden. Most of these processes must have been of a metasomatic nature but have effected changes in detail only. The main features were already established."

It is surely the Dalslandian regeneration that has given several geologists and also myself the impression that the gneissification was entirely a young process.

Complementary determinations ought to be made on specimens from the map-sheets Levene (south of Lidköping) and Halmstad and also of the Varberg charnockite.

The Sveconorwegian Regeneration Period of Southwestern Sweden and Southern Norway

In the Precambrian of Southern Norway a great many age determinations have been made. These have been put together by H. Neumann in a paper: "Apparent ages of Norwegian Minerals and Rocks". This paper will soon be published in *Norsk geologisk tidskrift*. By the courtesy of Neumann I have got a copy. In the concluding general remarks Neumann points out that the published age determinations indicate "that two epochs have been more important than others, as the geological events of greatest consequense in Precambrian times in this country (Norway) seem to have taken place during two periods, one from about 900 to about 950 million years, and another at about 1 100 million years. It is surprising, that during the reconaissance work done so far there have been no indications of rock-forming processes at time about 1 400 m.y. and about 1 800 m.y. so common in other parts of the world and also in areas not too far away."

In Southwestern Sweden we have, as has been stated above, at present no age data older than 1 130 m.y. and no data younger than 920 m.y. This epoch in Sweden corresponds very well with the two epochs distinguished by Neumann for the Precambrian of Southern Norway.

"The Precambrian rocks of south Norway", Neumann continues, "has been divided into three formations on the basis of geological investigations, namely the southeastern area or the Östfold formation east of the Oslo graben, and the Kongsberg-Bamle formation and the Telemark formation west of it".

"The relations of these three formations to each other have been very vague and problematic, and the time of formation of their rock suites and their relativ ages have been matters of controversy. It is of great interest that young apparent ages as well as old apparent ages are found in all three formations, with the one exception, that rocks of an apparent age of about 1 100 m.y. have not at yet been traced in the Östfold formation. It is indicated that the whole of the pre-Cambrian in the south of the country is formed by a number of geological events which were pene-contemporaneous and in principle identical and that the variations in the resulting products were dependent on variations in the pressure and temperature conditions and in chemical environment from one place to another. The division into three (or four) formations may be mainly a geographical convenience and be of much lesser genetical importance than formerly anticipated."

In Southwestern Sweden we have distinguished Pregothian rocks, old Gothian or Svecofennian rocks (= Stora Le-Marstrand series), Gothian rocks and Dalslandian rocks. I have tried to explain the fact that they all give between 1 130 to 920 m.y., apparent ages as depending on a regional regeneration process in late Dalslandian time. It is according to my opinion the same regeneration that have gone over the Precambrian of Southern Norway that must be the explanation that no indications, through age determinations, of rockforming processes at times about 1 400 m.y. and about 1 800 m.y. have been found in Southern Norway. The Pregothian and Gothian rocks and also the rocks of the Stora Le-Marstrand series can be followed into Norway east of the Oslo field. As there are several age data in Southern Norway younger than 920 m.y. the regeneration seems to have continued longer in Norway than in Sweden but it seems to be clear that it began at about the same time on both sides of the boundary.

In the same way as we speak of the *Svecofennian-Karelian regeneration* in Finland and Sweden we can speak of the *Sveconorwegian regeneration* in Southern Norway and Southwestern Sweden. I am convinced that there has been a long and complicated history before this regeneration even in Norway

Late Precambrian (Riphean) in Sweden

Polkanov and Gerling classify all Precambrian rocks in Southwestern Sweden and Southern Norway as Riphean. This cycle contains according to them two intrusion periods, 1 090—865 in Southern Scandinavia and 640—600 on the Kanin peninsula and in northeasternmost Norway. The first of these periods is the period for which I just have proposed the term Sveconorwegian. Considering the definitions of the term Riphean given by N. S. Schatsky in his paper about "Principles of Late Pre-Cambrian Stratigraphy and the Scope of the Riphean Group" the present author is of the opinion that this period must be considered as older than the Riphean evolution. Riphean sediments start as V. V. Menner has expressed it in his paper "On the Nomenclature Problem of the Upper Precambrian Group" a new stage in the Earth's development characterized by the formation of presently existing great geotectonic elements. They belong to Stille's Neogeicum while on the other hand the Sveconorwegian evolution belongs to Paleogeicum.

If the term Riphean shall be used in Scandinavia Polkanov and Gerling are right in classifying the Almesåkra and Visingsö series as Riphean. A specimen of the former has given 964 m.y., and of the latter 985 m.y. Polkanov and Gerling consider these to be the ages of the rocks themselves. The Visingsö series must, however, belong to the youngest part of the Precambrian, to what Swedish geologists usually call Eocambrian. The explanation, according to the present author, is that the age data is the age of the mica and not of the sediment. The same explanation is surely valid also for the Almesåkra series, which Swedish geologists classify as Jotnian.

Of the Jotnian Dala sandstone a specimen northeast of Orsa gave an age of 1 185 m.y. Even for this determination the same explanation is according to my opinion valid. In all three cases the material in the sediments has probably come from a region with rocks that primarily or secondarily, in the latter case through regeneration have got proportions between Potassium 40 and Argon 40 that correspond to these age data.

Polkanov and Gerling ought naturally to classify the Jotnian Dala sandstones as Riphean. N. S. Schatsky on the other hand maintains that between Jotnian and Riphean there is a "tremendous interval". This interval was, according to him, "accompanied by a high position of tremendous continents". He regards the Jotnian sandstones as "representing sort of late molasse of the underlying multiply dislocated and metamorphosed Precambrian rock masses, with which they are closely associated". This line of thought that the Jotnian sandstones are a sort of molasse connected with the Svecofennian-Karelian folding has also been taken up by the Finnish geologists, who consider the Jotnian sandstones to be of nearly the same age as the Rapakivi granites.

Simonen has discussed this problem in his paper: "Precambrian stratigraphy of Finland." According to him "sandstones similar to the Jotnian sandstone in Satakunta occur in the Kola peninsula, East Karelia, and Sweden. They have been interpreted generally as post-geosynclinal deposits in relation to the Precambrian Karelidic orogeny. The Jotnian sandstones in East Karelia belong to the upper section of the Karelian cycle of sedimentation. The age of the Jotnian sandstone may be approximately the same as that of the Rapakivi granites (1 620 m.y. according to Kouvo, 1958) which occur in close association with Jotnian formations. Some sedimentary rocks in Sweden, considered as Jotnian formations, are probably younger than the Jotnian of East Karelia and Finland, because, in the Los-Hamra and Almesåkra areas they overlie Gothian and Dalslandian sediments and granites whose ages seem to be considerably less than that of the Karelidic orogeny. It may be necessary to divide the present Jotnian formations in Fennoskandia into two groups; the older representing post-geosynclinal sediments in relation to the Karelidic movements, and the younger representing similar sediments in relation to the Gothidic movements. The name Jotnian must be used only for the former group."

It is apparent from this quotation that Simonen will restrict the term Jotnian to sandstones which for more or less unspecified reasons have been nearly connected with the Karelides. The Dala sandstones and the Almesåkra series are, however, as Simonen also points out, younger. They must according to the age determinations be younger than the Dalslandian regeneration. Why cannot the Satakunta sandstones also be so young?

Beneath the Swedish Dala sandstones, classified as Jotnian, occur the Subjotnian Dala porphyries. They are intruded by granites which mineralogically and structurally are extremely well preserved. Even the porphyries have their original structures extraordinarily well preserved, as H. von Eckermann in particular has shown. The porphyries must therefore be distinctly younger than the Svecofennian-Karelian metamorphic processes and must have been formed on a land surface cut out in the Svecofennian-Karelian bedrock. The Dala sandstone in its turn was deposited on a land surface excavated in the Subjotnian bedrock.

S. Hjelmqvist, who is preparing a new map of Dalecarlia, thinks that he has good observations showing that the Rätan granite and the Järna granite at the eastern boundary of the Subjotnian volcanic area are younger than the Dala porphyries. Remarkable is in that case that, as has been mentioned before, a specimen of the Rätan granite taken near the eastern boundary of the massif west of Kårböle has given an age of 1 850 m.y. and that a specimen of the Järna granite from Dala-Järna has given 1 870 m.y. The geological observations and the age determinations evidently contradict each other in this case, and it is difficult to give a satisfactory explanation. It is naturally necessary to make more age determinations on these granites and above all on specimens taken as near the volcanics as possible.

Mobile Belts of the Baltic Shield in the Light of Mineral Dating

In a paper about "continents and mobile belts in the light of mineral dating" Gordon Gastil relates that J. Tuzo Wilson 1949 had observed that "mineral dates subdivided North America into a sequence of successive orogenic provinces — oldest at the centre, youngest at the ocean margin. Thus he hypothesized that the continents had grown from continental nuclei by the accretion of roughly concentric geosynclines welding new sialic differentiate to the continental margins."

One of Gastil's maps published in the paper shows how in a central zone over the region between Hudson Bay and Lake Superior continuing southwestwards into the United States the age determinations have given 2 400— 2 700 m.y. On both sides there follow belts in which the age determinations fall in the interval 1 650—1 850 m.y. and outside them belts in which the determinations fall between 1 250 and 1 450 m.y. and then belts with determinations between 950 and 1 100 m.y. Along the east coast of the continent the ages fall between 250 and 550 m.y.

According to the age determinations made by Polkanov and Gerling for the Baltic shield a belt stretches along the northern coast of the Kola peninsula in which rocks belonging to what they call Katarchean (3 500—3 000 m.y.) appear as relics in the dominating Samian rocks (2 870—2 150 m.y.). Along th southern coast of the Kola peninsula and southeastern coast of the White Sea and from this region continuing towards northwest into Finland and Norway have Polkanov and Gerling distinguished a belt with rocks belonging to the Belomorian. In this belt also the granulites are situated. The age is 2 100—1 950 m.y. Between these two well defined belts there is a zone in which both Samian and Belomorian rocks have been found and also rocks belonging to Svecofennian-Karelian age. The northern boundary for the latter rocks stretches along the northern boundary for this zone.

Southwest of the Belomorian zone follows a zone which Polkanov and Gerling have called the Svecofennian-Karelian zone. The southwestern boundary for this zone is drawn from the northern shore of Lake Ladoga as a nearly straight line over Uleåborg in Finland and Luleå in Sweden and then in the same direction up to the Caledonian front. Within this zone Samian and Belomorian gneisses appear as a basement for the Karelian sediments. The southwestern boundary of this zone is also the southwestern boundary for the Samian rocks. Southwest of this zone follows the broad Svecofennian zone in Finland and Sweden.

The attempt of Polkanov and Gerling to draw the boundaries for the younger zones in southern Sweden and Norway is less successful. First, why draw two boundaries east of Lake Vättern, one as the southern boundary of Svecofennian-Karelian and an other as the eastern boundary for the Gothian? Secondly, why draw a north-south boundary over the western part of Lake Vänern as the boundary between Gothian in the east and "Riphean" in the west.

It is clear from geological investigations that the Svecofennian rocks towards the southwest are bounded by the Gothian rocks which, according to the age determinations, are 1 660—1 420 m.y. This Gothian area is bounded towards the west by a broad schistosity zone, the age of which seems to be 1 380—1 240 m.y. even if movements in this zone continued in Dalslandian time.

Then follows towards the west a zone which extends over southwestern Sweden and southern Norway, south of the Caledonides. The age determinations have, for this large area, given 1 130—920 m.y. for Sweden and about 1 200—about 700 m.y. for Norway.

This summary of the geochronological division of the Precambrian of the Baltic shield has shown how younger and younger mobilized and regenerated belts are added on to the Samian nucleus with its relics of Katarchean rocks on the northern half of the Kola peninsula.

These belts of different ages can be followed up to the Caledonian front that cut them all. Between the Caledonian folding and the orogenic processes in the Precambrian belts discussed above a long anorogenic period elapsed, during which a successive peneplaning of the rising Baltic shield occurred. Remnants of the sediments formed in Precambrian time in connection with this peneplanation are the sandstones we call Jotnian in Sweden and the Eocambrian sparagmite and quartzite series in the eastern marginal zone of the Caledonian mountains and also the Visingsö series which for good reasons is considered to be late Eocambrian.

If the term Riphean should be used in Sweden it should be for these sediments which originated during the anorogenic period between the Dalslandian and the Cambrian. For this period we have in Sweden used the term Algonkian on the new map of the Prequaternary rocks of Sweden. The youngest and best preserved part of the sediments in the Telemark area in Norway should perhaps also be classified as Riphean as absolute age determinations based on minerals from quartz veins and granite pegmatites which cross-cut these sediments give 950—620 m.y., according to J. A. Dons.

The Relations between Southwestern and Southeastern Sweden in Late Precambrian (Riphean) Time

The occurrence of Jotnian sandstones and of Subjotnian volcanics and intrusive rocks only to the east of the southwestern gneisses is a fact of extraordinary interest that calls for an explanation. The same is true for the Jotnian diabases which occur as effusive beds or as sills in the Jotnian sandstones and as dikes within the schistosity zone and here and there east of it but never west of it.

The author has, in the "Description to accompany the map of the Prequaternary rocks of Sweden", touched upon this problem lightly. The author's line of thought is that southwestern Sweden after the Dalslandian sinking that caused the regeneration of the Pregothian, Gothian and Dalslandian rocks began to rise during a phase of strong pressure. At the same time tensional forces dominated in eastern Sweden originating a great many fissures and faults and dividing the bedrock in blocks moving with respect to each other.

The fissures and faults facilitated the emergence of the Subjotnian volcanic and intrusive rocks, which all have extremely well preserved structures as they never have been reached by the orogenic movements. The formation of fissures and faults continued during Jotnian time and has made the intrusion of the great number of diabases possible.

Southwestern Sweden was apparently under such high pressure that a corresponding formation of fissures and faults was impossible. It is also probable that this region was highland in comparison with the eastern area. Material from this highland ought, in such a case have been transported towards the east and deposited there. The fact that no Jotnian sandstones have been found in southwestern Sweden must depend upon a continued rising and peneplaning even after Jotnian time so that all such sediments could be transported away.

In this way the author has tried to explain the great differences between southeastern and southwestern Sweden in Subjotnian and Jotnian time and it is easy to understand why good age determinations on rocks from these times are desirable.

At last the author and his successor Director K. A. Lindbergson wish to express their gratitude for the absolute age determinations that Academician A. A. Polkanov and Professor E. K. Gerling in Leningrad have made for them and for the Geological Survey of Sweden. The author also wishes to express his gratitude for the determinations Academician N. P. Semenenko has made on Swedish Precambrian sediments.

This paper is to be considered as a first report on age determinations of rocks and minerals from the collections of the Geological Survey of Sweden. The author has in this paper shown that a great many complementary determinations are necessary to clear up the details in different parts of the Precambrian of Sweden. As soon as enough determinations have been made a second paper will be prepared. The essential problems are in the authors opinion the regeneration processes and their influences on the apparent ages of the different rocks.

Geological Survey of Sweden,
Stockholm, November 1960

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— 1936: Om cykelindelningen i det svenska urberget Geol. För. Förh., Bd 58, pp 102—108.

— 1936: The evolution of the lower Archean rocks in Central Sweden and their Iron, Manganese and Sulphide ores. Quaterly Journal of the Geological Society, pp 332—358.

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— 1960: The Swedish Precambrian outside the Caledonian Mountain Chain (in Description to accompany the Map of the Pre-Quaternary rocks of Sweden) Sver. Geol. Unders., Ser. Ba, No 16.

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SCHATSKY, N. S., 1960: Principles of late Precambrian stratigraphy and the scope of the Riphean group. International Geological Congress 1960, Part VIII. Late Pre-Cambrian and Cambrian Stratigraphy, pp 7—17.

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WILSON, J. TUZO, 1949: The origin of continents and Precambrian history. Royal Soc. Canada Trans. v. 43, Ser. 3, pp 157—182.

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Swedish Geological Literature 1956—1957

Edited by

WALTER LARSSON

The following bibliography constitutes the continuation of the annual series which was published in this journal by R. Sandegren from 1927 to 1955 under the title "Revue annuelle de la littérature géologique suédoise". For practical reasons each issue until further notice will now comprise two years.

The bibliography 1956—1957 aims at being a complete list of the geological literature published in Sweden during the time stated, as well as of papers printed abroad and written by Swedish authors or dealing with Swedish geology. Papers written in one of the principal languages and those having abstracts or summaries in these languages are merely listed. Other papers are briefly reviewed in English excepting those assigned to the headings of "Biographical data" and "Miscellaneous". The titles are given in the original language and in English translation. On the whole the same subdivision into subject groups has been used as in earlier issues of the bibliography.

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LIST OF ABBREVIATIONS

Journals, etc.

AB = Annales Biologiques.
AC = Acta Crystallographica.
ACS = Acta Chemica Scandinavica.
BGIU = Bulletin of the Geological Institutions of the University of Uppsala.
BN = Botaniska Notiser.
BVM = Beten, Vallar, Mossar.
CMJ = Canadian Mining Journal.
EM = Electron Microscopy. Proceedings of the Stockholm Conference, Sept. 1956.
EMJ = Engineering and Mining Journal.
GA = Geografiska Annaler.
GFF = Geologiska Föreningens i Stockholm Förhandlingar.
GP = Grana Palynologica.
HV = Handbok om Växtnäring.
JKA = Jernkontorets Annaler.
KLA = Kungl. Lantbrukshögskolans Annaler.
KVA = Kungl. Svenska Vetenskapsakademien.
LSL = Lantmannen. Svenskt Land.
NGT = Norsk Geologisk Tidsskrift.
NJF = Nordisk Jordbrugsforskning.
QPCM = Quelques Problèmes de Chimie Minérale. Dixième Conseil de Chimie tenu à l'Université de Bruxelles du 22 au 26 mai 1956. Rapports et discussions.
SBT = Svensk Botanisk Tidskrift.
SGU = Sveriges Geologiska Undersökning.
SGÅ = Svensk Geografisk Årsbok.
SJF = Statens Jordbruksförsök.
SKT = Svensk Kemisk Tidskrift.
SN = Sveriges Natur.
SNFÅ = Statens Naturvetenskapliga Forskningsråds Årsbok.
SST = Svenska Skogsvårdsföreningens Tidskrift.
STÅ = Svenska Turistföreningens Årsskrift.
TRI = Tercera Reunión Internacional sobre Reactividad de los Sólidos, 2—7 de Abril de 1956.
TT = Teknisk Tidskrift.
UUÅ = Uppsala Universitets Årsskrift.
VnV = Växt-närings-Nytt.
VoV = Värld och Vetande.

Reviewers

BA = Bror Asklund.
BL = Britta Lundblad.
EF = Erik Fromm.
EM = Ernest Magnusson.
EW = Eric Welin.
EÅ = Erik Åhman.
GK = Gunnar Kautsky.
GL = Gunnel Linnman.
HM = Hans Möller.
JL = Jan Lundqvist.
KN = Kaj Nilsson.
OG = Olof Gabrielson.
PHL = Per H. Lundegårdh.
RS = Ragnar Sandegren.
WL = Walter Larsson.

Regional Geology

Allgén, Carl: Jan Mayen. A lonely, desolate, arctic island. — SGÅ, 33, pp. 162—166, 1 text-fig. Lund 1957.

Allgén, Carl: Jan Mayen — en ensligt belägen, öde arktisk ö [Jan Mayen — a lonely, desolate arctic island]. — Geogr. Notiser, 14: 2, pp. 3—6, 1 text-fig. Stockholm 1956.

Some notes on the geology of the island are given. *WL.*

Andersson, Ingvar, and others: Introduction to Sweden. — The Swedish Institute, Stockholm, 294 pp., 118 text-figs., 2 plates. Uppsala 1956.

Areskog, Carl: En bok om Öland [A book about Öland]. — Gleerups Förl., 269 pp., 4 text-figs., 47 plates. Malmö 1957.

In the chapter Vad »berget» berättar [What the rock tells us] (pp. 99—125) a popular description is given of the geological development of the island of Öland from the Cambro-Silurian up to and inclusive of Quaternary time. *WL.*

Asklund, B.: Nya iakttagelser från mellersta fjällkedjan i Sverige [New observations from the middle part of the Caledonides in Sweden]. — NGT, 36, p. 71. Bergen 1956.

The mapping in Ströms Vattudal in Jemtland has shown that there under the Ström quartzite nappe at least two Cambro-Silurian nappes are present. In the westernmost Cambro-Silurian nappe Eo-Cambrian quartzites are to be found in the basal parts. The autochthonous complex of Archean rocks, sparagmites, and quartzites shows a rich stratigraphic development. *Inter alia* new finds of tillite were made. A tillite of the type of »boulder clay», belonging to the succession of strata of the Eo-Cambrian quartzites, is overlain by marine (Middle?) Cambrian with angular unconformity. *GK.*

Björk, Sven: Listerlandet och Ryssberget [Listerlandet and Ryssberget]. — Natur i Blekinge, pp. 255—266, 11 text-figs. Uppsala 1957.

Popular account of the nature of a part of the province of Blekinge, S. Sweden. *JL.*

Carlsson, Elver: Garpenbergstraktens geologi [Geology of the Garpenberg district]. — In Sam Rönnegård: Hedemora Bergslag. Garpenbergs socken, pp. 11—26, 6 text-figs. Falun 1957.

A popular review of the rocks and Quaternary deposits in the parish of Garpenberg is given based upon the geological map-sheets Hedemora and Horndal. The copper and iron ores of the area are also described. The account ends with a chapter dealing with the morphology and the significance of geology for the industrial life of the parish through the ages. *EÅ.*

Djurberg, Hans: Något om naturen i Älvsborgs län [A few notes on the nature in the county of Älvsborg]. — Lantbrukstjänstemannen, 39, pp. 143, 165, 1 portrait. Stockholm 1957.

A brief popular description of the geological conditions in the area, soils, flora, and fauna included. *WL.*

Eskola, Pentti: Einige Altersprobleme des fennoskandischen Grundgebirges [Some age problems of the Fennoscandian Archean]. — Neues Jb. Mineral., Abh., 91, pp. 213—222. Stuttgart 1957.

Fromm, Erik: Drag ur Västerbottens och Norrbottens geologiska utveckling [The geological development of Västerbotten and Norrbotten]. — Natur i Västerbotten och Norrbotten, pp. 20—41, 12 text-figs. Uppsala 1956.

A popular sketch of the Archean and Quaternary geology of the district at the northernmost Swedish coast of the Bothnian Bay, containing data from the recent mappings of the Geological Survey. *EF.*

Gavelin, Sven: Problem rörande urberg och malmer i Västerbottens län, N. Sverige. Kommentar till karta och beskrivning över Västerbottens berggrund [Problems concerning Archean geology and ores of the Västerbotten County, N. Sweden. Comments on map and description of the pre-Quaternary rocks of Västerbotten]. — Geologi, 8, pp. 40—41. Helsinki 1956.

The pre-Caledonian part of the geological survey map of Västerbotten with description (SGU, Ca 37, 1956) is discussed. *GK.*

Gullin, Henrik: Grunden vi bo på [The ground we are living on]. — Kroppefjäll. En Dalslandsbok. Socknarna Dalskog — Gunnarsnäs — Ör, pp. 9—11. Vänersborg 1957.

A brief description of bedrock and soils in the parishes mentioned made according to the mapping by the Geological Survey of Sweden in the 1860's. *WL.*

van der Harst, Taco Hajo: Geology and petrology of the Borga region, Västerbotten, Sweden. — Academical dissertation (Amsterdam), 141 pp., 36 text-figs., 1 plate. Dutch summary pp. 13—18. 'S-Gravenhage 1956. Also as Meded. Geol. Inst. Univ. Amsterdam, 233.

Hastrup, Frits: Indalsälven [The river Indalsälven]. — Kulturgeografi, 8, pp. 117—125, 8 text-figs. Aarhuus 1956.

Contains several statements as to the geology of the district. *WL.*

Hjulström, Filip: Mikkaglaciären i Sarek. Sarekstudier 1. Om geografisk forskning i Sarekområdet [The Mikka Glacier in the Sarek mountains, Swedish Lapland. Sarek studies. 1. Geographical investigations in the Sarek district]. — Geographica, 31, pp. 48—51. Uppsala 1957.

A review of Axel Hamberg's investigations 1895—1931 (topography, geology, glaciology, meteorology etc.), and recent mainly glaciological and geological work at the Geographical Institution of the Uppsala University. *EF.*

Holtedahl, Olaf: Grensen mellom Trondhjemsfeltet og sparagmittområdet i sydøst [The boundary between the Trondhjem field and the sparagmite district to the southeast]. — GFF, 78, p. 177. Stockholm 1956.

Owing to some objections presented by Per Holmsen concerning Holtedahl's description of the southeastern boundary of the »Trondhjem field» in Norway he (Holtedahl) gives an explanation. Holmsen's view about the tectonic nature of the boundary was published later than the relevant part of Holtedahl's work, »Norges geologi». However, Holtedahl means that the concept now argued by Holmsen was not clearly shown on the original schematic map concerning different rocks and tectonic lines of 1950. *BA.*

Holtedahl, Olaf: Junge Blockverschiebungstektonik in den Randgebieten Norwegens [Late block faulting in the marginal areas of Norway]. — Geotektonisches Symposium zu Ehren von Hans Stille, pp. 55—63, 1 portrait, 7 text-figs. Stuttgart 1956.

HWARFNER, AD.: Långared genom tiderna [Långared through the ages]. — 166 pp., 25 text-figs. Hässleholm 1957.

An introductory chapter contains a description of geology and morphology of the parish of Långared, Västergötland. *WL.*

JOHANSSON, BO: Landskapet Östergötland [The province of Östergötland]. — Lantbrukstjänstemannen, 39, pp. 3—5, 19, 3 text-figs. Stockholm 1957.

A brief popular description of morphology and geology of the province. *WL.*

JOHANSSON, EMIL: Kristianstads län [The county of Kristianstad]. — Lantbrukstjänstemannen, 39, p. 91, 2 text-figs. Stockholm 1957.

Some features of the geology of the county are briefly touched upon. *WL.*

KAUTSKY, GUNNAR: Ein Beitrag zur Stratigraphie und dem Bau des Skelleftefeldes, Nordschweden [The stratigraphy and geological history of the Skellefte district, Archean, Northern Sweden]. — SGU, C 543 [= Årsb. 49 (1955): 3], 65 pp., 25 text-figs., 4 plates. English summary pp. 57—64, abstract p. 4. Stockholm 1957.

KAUTSKY, G.: Skelleftefältets stratigrafi och geologiska historia [The stratigraphy and geological history of the Skellefte district]. — GFF, 78, pp. 569—570. Disc. Asklund, Eklund, Kautsky, ibid., pp. 569—572. Stockholm 1956.

A stratigraphic table of the rocks of the Skellefte district. A detailed paper in German with English summary has been published as SGU, C 543.

Asklund drew attention to the important stratigraphic changes in the accepted stratigraphy of the Skellefte field. All occurrences of the Vargfors conglomerate (Dömanberg conglomerate, the conglomerate at Ledfat) ought to be considered in the same context. The Revsund granite which has very great regional-geological significance has been placed too near the Sorsele granite on Kautsky's table. It should be placed in the (according to Kautsky) relatively insignificant hiatus between the Mensträsk conglomerate and the Vargfors conglomerate proper (Dömanberg conglomerate). The Vargfors conglomerate in the speaker's mind seems to belong to the Jatulian system, with a wide extension over the Scandinavian Archean surface.

The lecture for the most part concerned the conclusion presented by Eklund in 1923 (GFF, 45, pp. 219—223) that the Skellefte field was a flexure between a depressed area in the south with concordance between the older Leptite formation and the younger Bothnian schists, and a cratogene to the north with a break between these formations. This cratogene was the source of the Vargfors conglomerates occurring along its edge. Further to the south, limestones occur between the leptitic and schist formations. The flexure continues over to Finland in an ESE direction which is the main trend of the Skellefte field. On this line lies the Ylivieska conglomerate area which Mäkinen equated with the Vargfors conglomerate. The concordance between the Leptite and the Bothnian formations extends to Bergslagen and southern Finland. In Norrbotten, the Pajala formation (Lapponian) with its sedimentary iron ores, limestones, and graphites resting with a break on the Leptite formation with apatite iron ores, is considered as the cratogene facies of the Bothnian formation. The break against the ore-bearing porphyries is correlated with the Vargfors conglomerate. This explains the fact that the special relationship between the two types of iron ores is the same in Norrbotten as in Bergslagen.

The Arvidsjaur porphyries should stratigraphically be correlated with the Maurliden series or some part of it. The difference in petrographic development can be explained by interpreting the often reddish Arvidsjaur porphyries as being erupted under terrestrial conditions, while the grey porphyries of the Skellefte field were effusive in a marine milieu. The porphyries of the Skellefte field are often interlayered with marine sediments (graphite schists, limy rocks). Marine intercalations are completely absent in the Arvidsjaur porphyries. *GK.*

Lannerbro, Ragnar: Geologi och forntida bebyggelse [Geology and ancient settlement]. — Venjans församling 350 år, pp. 193—228, 17 textfigs. Falun 1957.

A rather detailed account of the geology of the parish of Venjan, bedrock (with map) and soils, as well as its archeology. *WL.*

Larsson, Carl: Lövångers socken i geologisk belysning [Geology of the parish of Lövånger]. — Natur i Västerbotten och Norrbotten, pp. 181—189, 5 text-figs. Uppsala 1956.

A popular sketch of pre-Quaternary tectonics and Quaternary geology of a district at the Bothnian Bay. *EF.*

Larsson, Walter & Sandegren, Ragnar: Beskrivning till kartbladet Vårvik [Explanation to the map-sheet Vårvik]. — SGU, Aa 187, 166 pp., 46 text-figs., 2 maps. Stockholm 1956.

Three series of supracrustal rocks occur within the map-area. The Late pre-Gothian St. Le—Marstrand series is predominantly composed of grey veined gneisses of sedimentary origin being rich in quartz and mica. Basic and, subordinately, reddish grey, acid volcanics also form part of the gneiss series as well as small ultrabasic intrusions now altered to soap-stone. Dikes of pegmatite are connected with the Late pre-Gothian veined gneiss formation. The Gothian Åmål formation comprises well preserved quartzitic sediments, rarely containing piemontite, as well as volcanics ranging from basic to acid. Quite locally the acid volcanics have been transformed into granite-like rocks connected with some simple pegmatite and composite pegmatite-granite dikes. The Gothian synorogenic infracrustal rocks which quantitatively are of great importance, range from diorite via grey Åmål granite and reddish grey intermediate types to red, in part extremely salic Kroppefjäll granite. A NNW striking system of greenstone dikes possibly marks the end of the Gothian era. Resting with great unconformity on the deeply eroded, often arkosic, Gothian rocks, the Dalslandian sequence of strata (the Dal formation) generally begins with a basal conglomerate followed by quartzitic sandstones, phyllites, and quartzites, and ending with the sparagmite-like Liane schists. Spilitic effusives occur at three different horizons in the sediment sequence. Special interest is attached to some rocks, *e. g.* the Gartjärn breccia, which have to be interpreted as differentiation products of the spilitic magma. Dikes younger than the Dal formation include an older series of pegmatite, feldspathic quartz, and quartz dikes (incl. breccias), more or less affected by the Dalslandian orogenic movements, as well as non-deformed, postorogenic dikes of Bohus granite-pegmatite and aplite. A system of dolerite dikes predominantly striking NW-SE holds a similar position in relation to the Dalslandian orogeny. *WL.*

Among the Quaternary deposits moraine has the greatest distribution. The highest Late-Glacial marine limit lies 162 m above sea-level in the southern, and 181 m in the northern part of the map-area. On the highest parts of the large plateaus lying above this limit the moraine is rich in fine-grained material, and has there to a great extent been brought under cultivation. On the slopes of the great valleys the moraine is very rich in boulders, and is mostly overgrown by forest. The bottom of the valleys is occupied by clay and sand sediments which are also cultivated, and of a great many lakes. Thus the settlement in this region is chiefly divided into two different levels. The glacial striae indicate that during the last glaciation the ice moved from NNE to SSW, but during the deglaciation stage ice lobes deviated down into the valleys of the lakes Östra Silen and Lelången. These ice lobes have oscillated so that Late-Glacial sediments locally have been disturbed and overlain by moraine. Some glaciofluvial eskers occur. At a certain stage of the ice-recession marginal terraces were built up nearly to the highest marine limit. In the deep fiords the outstreaming melt-water deposited seasonally laminated clay. During the land elevation the waves washed down sand and gravel from the slopes. In these sediments thin Late-Glacial shell beds containing marine molluscs and Balanidae occur on levels 153—125 m above the present sea-level. Contemporaneously deposited clay on the level of 101 m contains freshwater diatoms only. Thus by that time (about 7 000 years B. C.) the superficial water-layers of the fiords possessed a certain salinity, whereas the deeper layers kept fresh, owing to the fact that the cold sediment-loaded melt-water flowed out along the bottom creating an inwards running reaction-stream of saline water along the surface. The immigration of the vegetation, and the variations of the climate during Post-Glacial times have been studied by the investigation of peat deposits and sediments (5 pollen-diagrams). *RS.*

LINDBERG, BENGT: Brommabygden [The Bromma district]. — Ehlins, 151 pp., 77 text-figs. Örebro 1957. Also as Bromma Hembygdsfören. Årsskr., 29: 1. Örebro 1957 (1958).

A chapter on the geological development of the area up to and including the glacial period is given on pp. 24—30. *WL.*

LINNMAN, GUNNEL: Ett varv runt Billingen [A turn round Billingen]. — STÅ, 1956, pp. 263—275, 5 text-figs. Stockholm 1956.

A trip round Mount Billingen, Västergötland, Sweden, with geological aspects. *GL.*

LUNDEGÅRDH, P. H.: Berggrunden i Gävleborgs län [The Archean of the Gävleborg county]. — GFF, 78, p. 676. Disc. Asklund, Lundegårdh, ibid., pp. 676—677. Stockholm 1956.

A lecture before the Geological Society of Stockholm. *PHL.* — Disc. (Asklund): Asklund could not agree with the opinion of Lundegårdh that the titanium-vanadium iron ores of Kramsta may be a 'regenerated' sedimentary ore or an amphibolite of tuffitic origin. The composition of the basic mother rock was that of a pyroxene-bearing gabbro, apparently of noritic type, without olivine. Such a rock generally does not contain any more pronounced 'geochemical' amounts of chrome and nickel as Lundegårdh also himself has shown by his own geochemical studies. The speaker thought it would be possible to find also the peridotitic element of the differentiation series connected with the titaniferous iron ores described and in this way to verify the primary magmatic origin of these rocks. The speaker hoped that this would also turn out to be the case regarding the extension areas of porphyritic 'augen' gneiss-granites which now were the objects of Lundegårdh's doubts. *BA.*

LUNDEGÅRDH, PER H.: Synpunkter på mellersta Norrlands urbergsstratigrafi [Aspects of the Archean stratigraphy of Middle Norrland]. — GFF, 79, pp. 785—790, 2 text-figs. English abstract pp. 785—786. Stockholm 1957.

LUNDEGÅRDH, P. H.: Torslanda sockens geologi [Geology of the parish of Torslanda]. — Torslanda. En sockenskildring, pp. 12—19, 6 textfigs. Lund 1956.

A popular survey of an area on the western part of the isle of Hisingen, in the northwestern vicinity of Göteborg, Western Sweden. *PHL.*

Lundegårdh, P. H. & Lundqvist, G.: Beskrivning till kartbladet Uppsala [Explanation to the map-sheet Uppsala]. — SGU, Aa 199, 117 pp., 51 text-figs., 2 maps. English summaries pp. 57—59 and 101—104. Stockholm 1956.

Lundqvist, Jan: Blekinges geologi [Geology of Blekinge]. — Natur i Blekinge, pp. 17—35, 9 text-figs. Uppsala 1957.

Popular account of the geological history of the province of Blekinge, S. Sweden. *JL*

Lundqvist, Jan: Västeråstraktens geologiska förhållanden [The geologica conditions of the Västerås district]. — Västerås genom tiderna, 1, pp. 11—52 20 text-figs. Västerås 1956.

An account of the geological development of the region with emphasis on the Quaternary geology. *WL.*

Magnusson, Nils H.: Den fasta grunden [The solid ground]. — STÅ, 1957 pp. 24—40, 8 text-figs. Stockholm 1957.

A popular description of the bed-rock of Sweden, with a number of instructiv photographs. *PHL.*

Magnusson, N. H.: Det svenska urbergets indelning [The division of the Swedish Archean]. — NGT, 36, p. 79. Bergen 1956.

Author offers some new principles as regards the division of the Swedish Archean The Karelian of South-Western Sweden is thus distinguished as the Dalslandian because of the obscure character of the Karelian of Northern Sweden and Finland. *PHL*

Magnusson, Nils H., Lundqvist, G. & Granlund, Erik: Sveriges geolog [Geology of Sweden]. — Scand. Univ. Books, 557 pp., 240 text-figs., 2 plates Stockholm 1957.

A third revised edition of this well-known text-book on the geology of Sweden which has been described in earlier reviews of the Swedish geological literature (se GFF 1950, p. 408). *PHL.*

Moberg, Oskar, Näsmark, Karl-Erik & Nilsson, Yngve: Skolgeograf för fyraårig och femårig realskola samt flickskola. Första kursen [School-geo graphy for four-year and five-year middle schools and girls' schools. Firs course]. — 5th Ed., Sv. Bokförl. Norstedts, 421 pp., 289 text-figs. Stockhol 1956.

Contains a brief general description of bedrock and soils with special regard t Swedish conditions. *WL.*

Murris, Roelof John: Geology and petrology of the Gieravardo-Jofjälle region, Västerbotten, Sweden. — Academical dissertation (Amsterdam), 11 pp., 38 text-figs., 2 plates. Dutch summary pp. 11—18. Amsterdam 1957. Als as Meded. Geol. Inst. Univ. Amsterdam, 243.

Nelson, Helge & Rydefält, Elvi: Geografi för folkskolan. Under mec verkan av Algot Teng [Geography for the elementary school. In collaboratio with Algot Teng]. — Bergvalls, 274 pp., 282 text-figs. Stockholm 1956.

Contains a number of statements as to geology, mining, etc. with special regard Sweden. *WL.*

Nyman, Ebbe: Under atlantiskt insegel. Drag ur Bohusläns naturhistoria [Under Atlantic seal. A sketch of the natural history of Bohuslän]. — Bohuslän. En jubileumsskrift. 1907 7/3 1957. Bohusläns Gille, Stockholm, pp. 7—18. Uddevalla 1957.

A popular account of the geological history of Bohuslän with the chief stress laid upon the Quaternary geology. *WL.*

Näsmark, Karl-Erik & Nilsson, Yngve: Skolgeografi. Andra kursen [School-geography. Second course]. — 5th Ed., Sv. Bokförl. Norstedts, 192 pp., 197 text-figs. Stockholm 1956.

This text-book, adapted for the highest class of the middle school and the lowest class of the gymnasium, gives an account of the geological development of Scandinavia as the basis of a division into natural geographical districts and as the background for the description of the economic life. *WL.*

Näsmark, Karl-Erik, Nilsson, Yngve, Hjulström, Filip & Lagerstedt, Torsten: Geografi för gymnasiet. Tredje delen [Geography for the gymnasium. Third part]. — Sv. Bokförl. Norstedts, 138 pp., 65 text-figs. Stockholm 1956.

Contains *i. a.* an account of geology and morphology, mineral resources and mining in Scandinavia. *WL.*

Orrgård, Stellan & Almhult, Artur: Folkskolans geografi. Första delen: Sverige och övriga Norden [Geography of the elementary school. First part: Sweden and Scandinavia for the rest]. — Sv. Bokförl. Norstedts, 179 pp., 64 text-figs., 4 plates. Stockholm 1956.

Gives in comprehensible form the main features and certain details of the geology of Scandinavia and particularly of Sweden. *WL.*

Pilava-Podgurski, Nikolaj: Nya geologiska undersökningar vid Utö järnmalmsfält [New geological investigations of the Utö iron ore field]. — SGU, C 541 [= Årsb. 49 (1955), N:o 1], 54 pp., 23 text-figs. English abstract p. 4. Stockholm 1956.

Regnéll, Gerhard: Historisk geologi i »Sveriges geologi» [Historical geology in 'Geology of Sweden']. — GFF, 79, pp. 806—815. Stockholm 1957.

Comments on the chapters on historical geology, written by N. H. Magnusson, in the third edition of the text-book 'Sveriges geologi' (Geology of Sweden). Numerous deficiencies as to matter and form are criticized. *WL.*

Richter, Dieter: Geologischer Reisebericht aus Skandinavien [Account of geological travels in Scandinavia]. — Z. deutsch. geol. Ges., 108, p. 255. Stuttgart 1956 (1957).

Roos, Tage: Ammerån och Solbergsvattnet [The river Ammerån and the lake Solbergsvattnet]. — SN. Sv. Naturskyddsfören. Årsb., 47, pp. 119—137, 5 text-figs. Uddevalla 1956.

Popular description of the nature around the river Ammerån, especially the region S of Hammerdal, Jämtland, Middle Sweden. The geological history, the flora and fauna are treated. The development of the Hammerdal Ice Lake is of special interest. *JL.*

Rudberg, Sten: Ödemarkerna och den perifera bebyggelsen i inre Nordsverige. En diskussion av vissa orsakssamband bakom fördelningen bygd —

obygd [Deserts and peripheric settlements in the interior of North Sweden. A discussion of certain causes for the distribution of settled and unsettled country]. — Geographica, 33, 192 pp., 24 text-figs., 10 plates. English summary pp. 174—182. Uppsala 1957.

Rydberg, Sven: Dalälven — industrifloden [Dalälven — the industrial river]. — Nordisk Rotogravyr, 127 pp., 144 text-figs. Stockholm 1957.

Some statements are given as to geology and mining in the regions traversed by the river. *WL.*

Samzelius, Jonas L:son: Boken om Kumlabygdens forntid [The book on the ancient history of the Kumla district]. — Kumla Julblad, 28, pp. 6—8, 39, 7 text-figs. Kumla 1957.

On account of a forthcoming book on the oldest history of the Kumla region, Nerike, Central Sweden, some data are given in advance from contributions on the bedrock (J. Eklund), on the glacial landscape (A. Bergdahl), and on the post-glacial history of vegetation and oldest agriculture (S. Florin). *WL.*

Sandegren, Ragnar: Landet steg ur havet [The land rose from the sea]. — Hille vår hembygd, pp. 9—26, 4 text-figs. Gävle 1956.

A description of the geological history of the parish of Hille, Gästrikland, from the Archean up to present times. *WL.*

Seth-Stenung, Margareta: Huddinge. En socken i storstadens skugga [Huddinge. A parish in the shadow of the capital]. — Huddinge Hembygdsfören., 156 pp., 49 text-figs., 1 plate. Stockholm 1956.

In a chapter, pp. 9—14, a brief popular description of some outlines in the geology of the parish is given. *WL.*

Sjöberg, Sven: Söderfors. En historisk framställning utarbetad på uppdrag av Söderfors kommun [Söderfors. A historical account compiled by direction of the commune of Söderfors]. — KF:s Bokförl., 497 pp., 151 text-figs. Stockholm 1956.

The geology of the parish of Söderfors is dealt with in an introductory chapter, pp. 13—20. *WL.*

Sjögren, Erik: Hornsjön — en sjö med intressant förflutet [Hornsjön — a lake with an interesting history]. — Åkerbo Hembygdsfören. Årsb. 1957, pp. 21—45, 9 text-figs. Kalmar 1957. Also as Medd. fr. Uppsala Univ. Geogr. Inst., Ser. A, 127.

Lake Hornsjön is situated in the parish of Högby, Kalmar county, on the island of Öland, quite near the coast of Kalmarsund. Hornsjön, which has big fields of wind-blown sand on its eastern shore, is separated from Kalmarsund to the north-west by a beach accumulation. The lake has been lowered several times and one of the unwelcome results of these lowerings is the sand-drift to the east of the lake. The dunes and their vegetation are described. *EÅ.*

Stålhös, Göran: The Sparagmite series and the Vemdal quartzite of the Hede region, Härjedalen. — BGIU, 36, pp. 297—368, 22 text-figs., 1 plate. Uppsala 1956.

SUND, RALPH BUSTER: Nyare undersökningar inom nordöstra Upplands berggrund [New investigations of the bedrock of north-eastern Uppland]. — SGU, C 552 [= Årsb. 51 (1957), N:o 3], 32 pp., 6 text-figs., 1 plate. English abstract p. 3. Stockholm 1957.

SUNDIUS, NILS: Om de geologiska förhållandena inom Utö-området [On the geological conditions in the Utö region]. — GFF, 78, pp. 666—669, 1 text-fig. Stockholm 1956.

Sundius here gives a short review of the Archean geology of the Utö region in the south-eastern Stockholm skerries including some special aspects to the metamorphism and metasomatism of the supracrustal rocks (enrichment of alumina especially). *PHL.*

SÖRLIN, ANTON: Geografi. Del II. Främmande länder [Geography. Part II. Foreign countries]. — 4th Ed., Ehlins, Folkbildningsserien, 185 pp., 100 text-figs. Stockholm 1956.

Several statements are given as to geology and mineral resources of the various countries. *WL.*

WIDEGREN, J. A.: Brännkyrkas och Södertörns geologiska utveckling och första bebyggande [Geological development and first settlement of Brännkyrka and Södertörn]. — Medlemsblad f. Brännkyrka Hembygdsfören., 1955, 1A, pp. 1—5. Also in Brännkyrka genom tiderna, II. Stockholm 1956.

Brief popular description of the geological evolution of the district, including the formation of rocks as well as soils. *WL.*

ÅHMAN, ERIK: Degerberget, Baggen och Kluntarna. Några drag ur Piteåområdets berggrundsgeologi [Degerberget, Baggen, and Kluntarna. Some details from the bedrock geology of the Piteå region]. — SGU, C 555 [= Årsb. 51 (1957), N:o 6], 28 pp., 15 text-figs. English abstract p. 3. Stockholm 1957.

ÖDMAN, OLOF H.: Beskrivning till berggrundskarta över urberget i Norrbottens län [Explanation to bedrock map of the Archean of the Norrbotten county]. — SGU, Ca 41, 151 pp., 58 text-figs., 4 plates. English summary pp. 132—148. Stockholm 1957 (1958).

General and Dynamic Geology

ANDERSSON, OLLE: Flocculation at sedimentation. Part 1. A study of two-particle interaction. — Sv. Papperstidn., 59, pp. 540—545, 6 text-figs. English and German summaries p. 540. Stockholm 1956.

ANON.: Den svarta döden i Rancho la Brea. Naturens fruktansvärda fälla — en forskningens skattkammare [The black death in Rancho la Brea. The terrible trap of nature — a storehouse of science]. — VoV, 6, pp. 94—96, 4 text-figs. Göteborg 1956.

Gives a popular account of the fossil-bearing asphalt lakes near Los Angeles, U. S. A. *WL.*

Anon.: Kompassens missvisning i Sverige år 1956 [Declination of the compass in Sweden in 1956]. — Globen, 35, p. 76, 2 text-figs. Stockholm 1956.

Map of the magnetic declination in Sweden in the year 1956. *JL.*

Anon.: Oerhörd raskatastrof vid Göta älv [Tremendous landslide catastrophe at the river Göta älv]. — Sv. Dagbl. Årsb., 35, pp. 69—73, 4 text-figs. Stockholm (1957) 1958.

The course of events and detrimental effects of the landslide at Göta on the 7th of June 1957 are described. *WL.*

Anon.: Swedish Geophysical Observatory. — Science, 126, p. 691, 1 text-fig. Lancaster 1957.

Arnborg, Lennart: Erosion forms and processes on the bottom of the river Ångermanälven. The use of diving in fluvial-morphological investigations. — GA, 39, pp. 32—47, 14 text-figs. Stockholm 1957. Also as Medd. fr. Uppsala Univ. Geogr. Inst., Ser. A, 118.

Arrhenius, G. & Blomqvist, N.: Proportion of sedimentary components in the calcareous eupelagic area of the East Pacific. — Göteborgs K. Vet-. o. Vitt.-Samh. Reports of the Swedish deep-sea expedition 1947—1948. Vol. V. Sediment cores from the East Pacific. Fasc. II. Special contributions, pp. 229—233. Göteborg 1956.

Axelsson, Valter: Termiska studier i Skärsjön [Thermical studies in Lake Skärsjön]. — Geographica, 31, pp. 15—47, 10 text-figs. English summary pp. 45—47. Uppsala 1957.

Behrens, Sven: Den svenska landytans brutenhet [Relative relief of the Swedish land surface]. — SGÅ, 33, pp. 177—182, 1 text-fig. Lund 1957.

Discussion of the map »Relative relief of land surface» (maps 3—4 in »Atlas över Sverige») and comparisons with related methods of morphological investigations. *JL.*

Bergenhayn, J. R. M.: Jordkast — bortglömda geologiska fenomen [Earth shoots — forgotten geological phenomena]. — VoV, 7, pp. 271—276, 2 text-figs. Göteborg 1957.

Historical account of the earth-shoot phenomena together with a recapitulation of the attempts at their genetical explanation. *WL.*

Bigg, E. K.: A new technique for counting ice-forming nuclei in aerosols. — Tellus, 9, p. 394—400, 4 text-figs. Stockholm 1957.

Bjerning, Lars: Finjasjön [Lake Finjasjön]. — SGÅ, 33, pp. 171—172, 1 text-fig. Lund 1957.

Report of a sounding of Lake Finjasjön, Scania. The lake probably occupies a depression in several intersecting fissure zones. *JL.*

Blanchard, D. C. & Spencer, A. T.: Condensation nuclei in the vicinity of the island of Hawaii. — Tellus, 9, pp. 525—527. Stockholm 1957 (1958).

Blanchard, D. C. & Woodcock, A. H.: Bubble formation and modification in the sea and its meteorological significance. — Tellus, 9, pp. 145—158, 9 text-figs. Stockholm 1957. Also as Contr. fr. the Woods Hole Oceanogr. Inst., 875.

Block, L. & Herlofson, N.: Numerical integration of geomagnetic field lines. — Tellus, 8, pp. 210—214. Stockholm 1956.

Bolin, Bert: Det Internationella Geofysiska Året 1957—1958 [The International Geophysical Year 1957—1958]. — Sv. Dagbl. Årsb., 35, pp. 88—93, 5 text-figs. Stockholm (1957) 1958.

A brief survey of some problems which were to be investigated during the Geophysical Year. *WL.*

Bolin, Bert: Nuclear radiation measurements during the International Geophysical Year. — Nature, 180, pp. 311—312. London 1957.

Borg, Kjell: Results of geomagnetic observations at Abisko 1946—1950 with a summary of annual means 1921—1953. — K. Sjöfartsstyrelsen, Jordmagn. Publ., No. 17, 38 pp., 2 text-figs. Stockholm 1957.

Butzer, K. W.: Mediterranean pluvials and the general circulation of the Pleistocene. — GA, 39, pp. 48 —53. Stockholm 1957.

Byers, Douglas S.: The Bering bridge — some speculations. — Ethnos, 22, pp. 20—26, 1 text-fig. Lund 1957.

Båth, Markus: A continental channel wave, guided by the intermediate layer in the crust. — Geofis. pura e appl., 38, pp., 19—31, 5 text-figs. German summary p. 19. Milano 1957. Also as Meteor. Inst. K. Univ. Uppsala, Medd., 55.

Båth, Markus: An earthquake catalogue for Fennoscandia for the years 1891—1950. — SGU, C 545 [= Årsb. 50 (1956): 1], 52 pp., 1 text-fig. Stockholm 1956. Also as Meteor. Inst. K. Univ. Uppsala, Medd., 51.

Båth, Markus: A note on the measure of seismicity. — Bull. Seism. Soc. Amer., 46, pp. 217—218. Berkeley 1956. Also as Meteor. Inst. K. Univ. Uppsala, Medd., 50.

Båth, Markus: Erdbebenenergie [Earthquake energy]. — Bergakademie. Z. f. Bergbau, Hüttenwesen und verw. Wiss., 9 : 1, pp. 17—21, 1 text-fig. Freiberg 1957. Also as Veröffentl. des Inst. f. Angew. Geophys. der Bergakad. Freiberg, 29.

Båth, Markus: National report for Sweden. Seismology and physics of the earth's interior in Sweden 1954—1957. — 5 pp. Lund 1957.

Båth, Markus: Några aktuella problem och utvecklingslinjer inom fasta jordens fysik [Some modern problems and lines of development in the physics of the earth]. — SNFÅ, 9 (1955), pp. 186—189, 2 text-figs. Stockholm 1956.

A short review of current trends in seismology, geomagnetism, and gravimetry is given. *WL.*

Båth, Markus: Observations séismographiques de l'Observatoire géophysique de Kiruna de janvier à décembre 1955 [Seismological observations at the Kiruna geophysical observatory from January to December, 1955]. — Publ. de l'Inst. de Météor. de l'Univ. d'Uppsala, 123 pp. Lund 1957.

Båth, Markus: Observations séismographiques faites à l'Observatoire météorologique d'Uppsala de janvier à décembre 1955 [Seismological observations made at the Uppsala meteorological observatory from January to December, 1955]. — Publ. de l'Inst. de Météor. de l'Univ. d'Uppsala, 87 pp. Lund 1956.

Båth, Markus: Shadow zones, travel times, and energies of longitudinal seismic waves in the presence of an asthenosphere low-velocity layer. — Trans. Amer. Geophys. Union, 38, pp. 529—538, 5 text-figs. Washington 1957.

Båth, Markus: Some consequences of the existence of low-velocity layers. — Ann. di Geofis., 9, pp. 411—450, 8 text-figs. Italian summary pp. 448—449. Roma 1956. Also as Meteor. Inst. K. Univ. Uppsala, Medd., 54.

Båth, Markus: The problem of earth quake magnitude determination. — Publ. du Bureau Centr. Séism. Int., Sér. A, Trav. Sci., 19, pp. 5—93, 13 text-figs. Toulouse 1956. Also as Meteor. Inst. K. Univ. Uppsala, Medd., 52.

Båth, Markus & Benioff, Hugo: Aftershock sequence of the Kamchatka earthquake of November 4, 1952. — Bull. Geol. Soc. Amer., 68, p. 1819. Baltimore 1957.

Båth, Markus & Vogel, Andreas: Continental dispersion of seismic surface waves. — Geofis. pura e appl., 38, pp. 10—18, 4 text-figs. German summary p. 10. Milano 1957. Also as Meteor. Inst. K. Univ. Uppsala, Medd., 56.

Caldenius, Carl & Lundström, Rune: The landslide at Surte on the river Göta älv. A geologico-geotechnical study. Special chapters by Bror Fellenius and Erik Mohrén. — SGU, Ca 27, 64 pp., 30 text-figs., 6 plates. Stockholm 1956.

Clavering, Richard: Atlantis — myt eller verklighet? [Atlantis — myth or reality?] — Det Bästa, 15: 6, pp. 127—132. Stockholm 1957.

Some geological, biological, and archeological facts are presented which are in favour of the former existence of land areas corresponding to Platon's Atlantis. *WL.*

Cromwell, Townsend & Reid Jr., Joseph L.: A study of oceanic fronts. — Tellus, 8, pp. 94—101, 6 text-figs. Stockholm 1956.

Davidsson, Jan: Investigations of sand movements using radio-active sand. — SGÅ, 33, pp. 107—127, 10 text-figs. Swedish summary pp. 126—127. Lund 1957. Also as Lund Studies in Geogr., Ser. A., Phys. Geogr., 12 (1958).

Davidsson, Jan: Måkläppen, ett uttryck för labil jämvikt inom strandzonen [The island of Måkläppen, an example of labile balance in the littoral zone]. — SGÅ, 32, pp. 144—162, 10 text-figs. German summary p. 162. Lund 1956. Also as Medd. fr. Lunds Univ. Geogr. Inst., 351.

Davidsson, Jan: Scolt Head Island och Chesil Beach [Scolt Head Island and Chesil Beach]. — SGÅ, 33, pp. 166—171, 4 text-figs. Lund 1957.

Study of the formation dynamics of two British coastal islands. *JL.*

DYRING, ERIK: Det geofysiska året [The geophysical year]. — Världshorisont, 11: 5, pp. 13—15. Göteborg 1957.

Account of the projects before the geophysical year with special regard to the Swedish contributions. *WL.*

EDLUND, GUNHILD: Locknesjöns djupförhållanden och isskjutna vallar [Depth proportions and ramparts of Lake Locknesjön]. — Geographica, 31, pp. 191—205, 5 text-figs. English summary pp. 204—205. Uppsala 1957.

EGEDAL, J. & AMBOLT, N.: The effect on geomagnetism of the solar eclipse of 30 June 1954 (Supplementary communication). — Journ. of Atmosph. and Terr. Phys., 8, pp. 105—107. London 1956.

EKMAN, SVEN: Die Gewässer des Abisko-Gebietes und ihre Bedingungen [The waters of the Abisko district and their conditions]. — KVA, Handl., Ser. IV, 6: 6, 172 pp., 71 text-figs. Uppsala 1957.

EKMAN, SVEN: En undersökning av Torneträskområdets fjällvatten [An investigation of the mountain waters of the Torneträsk district]. — Sv. Fiskeri Tidskr., 66, pp. 169—171. Lund 1957.

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RASMUSSON, GUNNAR: Fränkische Alb: ett karstlandskap [Fränkische Alb: a karst landscape]. — Geogr. Notiser, 15: 2, pp. 2—3, 11, 2 text-figs. Stockholm 1957.

The karst phenomena in Jurassic dolomite in Fränkische Alb, Germany, the groundwater conditions and caves of the area are briefly described. *WL.*

RASMUSSON, GUNNAR: Primära karrenformer i Lofoten [Primary clint forms in Lofoten]. — SGÅ, 32, pp. 191—193, 2 text-figs. Lund 1956.

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RUDBERG, STEN: Terrängformer i Västerbotten och Norrbotten [Morphology of Västerbotten and Norrbotten]. — Natur i Västerbotten och Norrbotten, pp. 42—58, 13 text-figs. Uppsala 1956.

A summary of the pre-Quaternary and Quaternary morphological development of the district at the Bothnian Bay and the Finnish border. Pre-Quaternary fluviatil erosional cycles, Quaternary glacial erosion, and glacial accumulation forms are mentioned. *EF.*

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SUNDBORG, ÅKE: Klarälven under 150 år. En erosionskarta med beskrivning [The river Klarälven during 150 years. An erosion map with description]. — Nationen och Hembygden, 7, pp. 110—125, 2 text-figs., 1 plate. Uppsala 1957. Also as Medd. fr. Uppsala Univ. Geogr. Inst., Ser. A, 113.

The changes due to erosion and accumulation of the river Klarälven during 150 years. A popular summary of some of the results given in the following paper. *JL.*

SUNDBORG, ÅKE: The river Klarälven. A study of fluvial processes. — GA, 38, pp. 125—316, 60 text-figs., 2 plates. Stockholm 1956. Also as Inst. of Hydraulics, Royal Inst. of Techn., Stockholm, Sweden, Bull. 52 and Medd. fr. Uppsala Univ. Geogr. Inst., Ser. A, 115. Academical dissertation (Uppsala).

SVENSSON, ERIK: »Erosionsförsök» vid Ugerup [»Erosion» trials at Ugerup]. — NJF, 38, pp. 289—294, 1 text-fig. Disc. Aslyng, Heick, ibid., p. 294. Uppsala 1956.

The effect of a lee-side situation upon the growth and the influence of the wind upon temperature and water conditions of the ground were investigated. *JL.*

SVENSSON, HARALD: Beräkning av utjämnade fallkurvor för floder [Calculation of smoothed river-profiles]. — SGÅ, 32, pp. 139—143, 3 text-figs. English summary pp. 142—143. Lund 1956. Also as Medd. fr. Lunds Univ. Geogr. Inst., 350.

SVENSSON, HARALD: En kartometrisk metod för bestämning av skogsgränsens höjd [A cartometric method of determining the height of the timber line]. — SST, 54, pp. 205—208, 2 text-figs. Norrtälje 1956.

Description of a method of determination of the timber line with the aid of topographical maps and hypsographic curves. The method gives a mean value, independent of local irregularities. It is of special use when the timber line should be compared with the mass-elevation. *JL.*

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Tell, Leander: Grottorna i Lummelunda och ett nyupptäckt karstområde på Gotland [The caves in Lummelunda and a new karst region on Gotland]. — SN. Sv. Naturskyddsfören. Årsb., 47, pp. 59—66, 2 text-figs., 1 plate. Uddevalla 1956.

Popular description of the caves and karst phenomena at Lummelunda, Isle of Gotland. *JL.*

Tell, Leander: Grottor och hembygdsvård [Caves and country conservation]. — Bygd och Natur. Tidskr. f. Hembygdsvård, 38, pp. 212—216, 5 text-figs. Malung 1957.

A popular survey of the occurrences of caves in Sweden and their preservation. *JL.*

Tideström, S. H:son (Tm): Skred — ras, jord — mark [Slip — fall, earth — soil]. — TT, 87, p. 1128. Norrköping 1957.

Terminological discussion and definitions of different Swedish words for »land-slide» and of the Swedish words for earth and soil. *JL.*

Torstensson. G. & Nilsson, Nils M.: Redogörelse för vinderosionsundersökningar utförda vid Kungl. Lantbrukshögskolans institution för allmän jordbrukslära åren 1950—55 [Report on wind-erosion investigations executed in 1950—55 at the Institute of general agricultural science of the Royal Agricultural College of Sweden]. — NJF, 38, pp. 283—288. Uppsala 1956.

The changes of level of the ground surface due to wind erosion as well as the eroding material were investigated. The amount of the wind erosion was rather small and the eroding material mainly of the grain size 0.6—0.06 mm. *JL.*

Welander, Pierre: Wind action on a shallow sea: some generalizations o Ekman's theory. — Tellus, 9, pp. 45—52, 5 text-figs. Stockholm 1956 (1957).

Wexler, H.: Variations in insolation, general circulation and climate. — Tellus, 8, pp. 480—494, 10 text-figs. Stockholm 1956.

Wideland, Bror: Report on geodetic operations in Sweden for the period 1954—1957. — Rikets Allm. Kartv., Medd. No. 28, 7 pp., 1 text-fig., 2 plates. Stockholm 1957.

Wideland, Bror: Topographic-isostatic anomaly-maps of Sweden according to the Pratt-Hayford and the Airy-Heiskanen systems. — Rikets Allm. Kartv., Medd. No. 26, 3 pp., 5 plates. Stockholm 1956.

Woodcock, A. H.: Atmospheric sea-salt nuclei data for Project Shower. — Tellus, 9, pp. 521—524. Stockholm 1957 (1958).

Wüst, Georg: Ergebnisse eines hydrographisch-produktionsbiologischen Längsschnitts durch die Ostsee im Sommer 1956. I. Die Verteilung von Temperatur, Salzgehalt und Dichte [Results of a hydrographic and production-biological longitudinal section through the Baltic in the summer 1956. I. The distribution of temperature, salinity, and density]. — Kieler Meeresf., 13, pp. 163—185, 12 plates. English summary p. 185. Kiel 1957.

Wüst, G.: On the thermal micro-stratification of the Baltic, with especial reference to the layers of the deep and bottom water. — AB, 13, pp. 102—104, 2 text-figs. Copenhague 1956 (1958).

Wäre, Matti: Om högvattenavrinningen på små nederbördsområden [On the high-water discharge from small precipitation areas]. — NJF, 39, pp. 155—159, 5 text-figs. Disc. Hallgren, Lyshede, Tryselius, Löddesöl, Kaitera, Hallin, ibid., pp. 159—161. Uppsala 1957.

The water discharge from three small areas in Finland were investigated. The discharge from a cultivated area was much greater than from a forest area. The discharge from a mixed area corresponded to the relation between cultivated and forest areas. *JL.*

Zaitsev, G.: Baltic — Belt Seas. Hydrography. Soviet observations. Mixing of water masses in 1955 and 1956. — AB, 13, pp. 107—109. Copenhague 1956 (1958).

Geochemistry

Arnold, James R. & Anderson, Ernest C.: The distribution of carbon-14 in nature. — Tellus, 9, pp. 28—32, 1 text-fig. Stockholm 1956 (1957).

Arrhenius, G., Bramlette, M. N. & Picciotto, E.: Localization of radioactive and stable heavy nuclides in ocean sediments. — Nature, 180, pp. 85—86. London 1957.

Banse, Karl: Ergebnisse eines hydrographisch-produktionsbiologischen Längsschnittes durch die Ostsee im Sommer 1956. II. Die Verteilung von Sauerstoff, Phosphat und suspendierter Substanz [Results of a hydrographic and production-biological section through the Baltic in the summer of 1956. II. The distribution of oxygen, phosphate, and suspended substance]. — Kieler Meeresf., 13, pp. 186—201, 6 plates. English summary p. 199. Kiel 1957.

Berrit, G. R. & Rotschi, H.: Chemical analyses of cores from the Centra and West equatorial Pacific. — Göteborgs K. Vet.- o. Vitt.-Samh. Reports o the Swedish deep-sea expedition 1947—1948. Vol. VI. Sediment cores from the West Pacific. Fasc. II, pp. 51—58, 23 plates. Göteborg 1956.

Blix, R., v. Ubisch, H. & Wickman, Frans E.: A search for variations i the relative abundance of the zinc isotopes in nature. — Geochim. et Cosmochim. Acta, 11, pp. 162—164. Belfast 1957.

Brodin, Gunnar: Sampling technique and chemical examination of air and precipitation. III. Determination of chloride. — KLA, 22, pp. 391—394 Uppsala 1956.

Brodin, Gunnar: Sampling technique and chemical examination of air and precipitation. IV. Chemical examination. — KLA, 22, pp. 395—410, 5 text-figs. Uppsala 1956.

Callendar, G. S.: The effect of fuel combustion on the amount of carbo dioxide in the atmosphere. — Tellus, 9, pp. 421—422. Stockholm 1957.

Carlsson, C. G.: A triggered 220—V a. c. spark for high precision in meta analysis. — Spectrochim. Acta, 11, pp. 370—376, 6 text-figs. Disc. Bokhout Menzies, van Someren, Bills, Carlsson, ibid., p. 376. London 1957.

Craig, Harmon: The natural distribution of radiocarbon and the exchang time of carbon dioxide between atmosphere and sea. — Tellus, 9, pp. 1—17 1 text-fig. Stockholm 1956 (1957). Also as Contr. fr. the Scripps Inst. o Oceanogr., 895.

Danielsson, Allan (A. D.): Några synpunkter på utvecklingsmöjlighete inom emissionsspektralanalysen [Some points of view as to possibilities of deve-lopment of the emission spectral analysis]. — SKT, 68, p. 633. Stockholm 1956

A short summary of a lecture given in 1956 in the Analytical Section of the Swedis Chemical Association. *WL.*

Degenhardt, Heinz: Untersuchungen zur geochemischen Verteilung de Zirkoniums in der Lithosphäre [Researches on the geochemical distribution o zirconium in the lithosphere]. — Geochim. et Cosmochim. Acta, 11, pp. 279—309. English abstract p. 279. Belfast 1957.

Oligoclase from Ytterby contained 12 g Zr/ton, magnetite from Kirunavaara 34 Zr/ton. *WL.*

Du Rietz, Torsten: The content of chromium and nickel in the Caledonia ultrabasic rocks of Sweden. — GFF, 78, pp. 233—300, 52 text-figs. Stockhol 1956. Also as Bolidens Gruvaktiebolags verksamhet: Vetenskapl. och tekn. skr. 44.

Egnér, Hans & Johansson, Olle: Sampling technique and chemical exami-nation of air and precipitation. I. Sampling technique. — KLA, 22, pp. 369—382, 6 text-figs. Uppsala 1956.

Eriksson, Erik: The chemical composition of Hawaiian rainfall. — Tellu 9, pp. 509—520. Stockholm 1957 (1958).

Eriksson, E. & Welander, P.: On a mathematical model of the carbon cycle in nature. — Tellus, 8, pp. 155—175, 17 text-figs. Stockholm 1956.

Fernlund, Uno, Zechner, Sepp & Olofsson, Rune: Snabb metod för bestämning av fosfor [Rapid method for determination of phosphorus]. — JKA, 140, pp. 386—388. German summary p. 388. Uppsala 1956.

Fonselius, Stig, Koroleff, Folke & Wärme, Karl-Erik: Carbon dioxide variations in the atmosphere. — Tellus, 8, pp. 176—183, 7 text-figs. Stockholm 1956.

Friedman, I. & Woodcock, A. H.: Determination of deuterium-hydrogen ratios in Hawaiian waters. — Tellus, 9, pp. 553—556, 3 text-figs. Stockholm 1957 (1958).

Gavelin, S.: Om variationerna av de stabila kolisotoperna i kol från några prekambriska och kaledoniska karbonatstenar och skiffrar och deras signifikans [On the variations of the stable carbon isotopes in carbon from some pre-Cambrian and Caledonian limestones and schists, and their significance]. — NGT, 36, p. 75. Bergen 1956.

A short abstract of a lecture given at the Second Nordic Geologic Winter Meeting in Oslo, 1956. *WL.*

Gavelin, Sven: Variations in isotopic composition of carbon from metamorphic rocks in northern Sweden and their geological significance. — Geochim. et Cosmochim. Acta, 12, pp. 297—314, 4 text-figs. Belfast 1957. Also as Medd. fr. Stockholms Högsk. Min. Inst., 218.

Gorham, Eville: The chemical composition of some waters from lowland lakes in Shropshire, England. — Tellus, 9, pp. 174—179. Stockholm 1957.

Gorškova, T. I.: Chimičeskij sostav gruntovych rastvorov Baltijskogo mor'a [The chemical composition of interstitial waters of Baltic sediments]. — Doklady Akademii Nauk SSSR, 113, pp. 863—865. Moskva 1957.

Gundersen, K.: Växtnäringsämnenas kretslopp [Circulation of plant nutrients]. — VnV, 13, pp. 1: 19—1: 24, 6 text-figs. Stockholm 1957.

The outlines of the circulation of nitrogen and phosphorus in nature are given. *WL.*

Hecht, F. & Patzak, R.: Chemische Analyse von in Tiefseesedimenten gefundenen mikroskopischen Kügelchen vermutlich kosmischen Ursprunges [Chemical analysis of microscopic spherules found in deep-sea sediments and probably of cosmic origin]. — Astronautica Acta, 3, pp. 47—51. English summary p. 47. French summary pp. 47—48. Wien 1957.

The paper is based on material from deep-sea sediment cores of red clay, taken by he Swedish deep-sea expedition in the Pacific Ocean during 1947—48. *WL.*

Herman, F. A. & Gorham, E.: Total mineral material, acidity, sulphur and nitrogen in rain and snow at Kentville, Nova Scotia. — Tellus, 9, pp. 180—183. Stockholm 1957.

Johansson, Olle & Brodin, Gunnar: Sampling technique and chemical examination of air and precipitation. II. Determination of sulfur compounds. — KLA, 22, pp. 383—390, 4 text-figs. Uppsala 1956.

Junge, Christian E.: Chemical analysis of aerosol particles and of gas traces on the island of Hawaii. — Tellus, 9, pp. 528—537, 2 text-figs. Stockholm 1957 (1958).

Junge, Christian E.: Recent investigations in air chemistry. — Tellus, 8, pp. 127—139, 7 text-figs. Stockholm 1956.

Junge, Chr. E. & Gustafson, P. E.: On the distribution of sea salt over the United States and its removal by precipitation. — Tellus, 9, pp. 164—173, 6 text-figs. Stockholm 1957.

Kanwisher, John: Oxygen in Antarctic air. — Tellus, 9, pp. 137—138. Stockholm 1956 (1957).

Kirsten, Wolfgang J.: Exchange spectrophotometry. I. — Mikrochimica Acta, 1956, pp. 1617—1620, 1 text-fig. German and French summaries p. 1620. Wien 1956.

Kirsten, W. J.: Microdetermination of halogens. A zinc absorption method. — Mikrochimica Acta, 1957, pp. 289—295, 1 text-fig. German and French summaries p. 295. Wien 1957.

Koczy, F. F.: Geochemistry of the radioactive elements in the ocean. A critical summary. — Deep-Sea Res., 3, pp. 93—103, 1 text-fig. London 1956.

Koczy, F. F.: The specific alkalinity. — Deep-Sea Res., 3, pp. 279—288, 4 text-figs. London 1956.

Koczy, F. F., Picciotto, E., Poulaert, G. & Wilgain, S.: Mesure des isotopes du thorium dans l'eau de mer [Measurement of thorium isotopes in seawater]. — Geochim. et Cosmochim. Acta, 11, pp. 103—129, 2 text-figs. English abstract pp. 103—104. Belfast 1957.

Koczy, F. & Titze, H.: Eine rasche Präzisionsbestimmung von Kalk in kleinen Sedimentmengen [A rapid precision determination of lime in small sediment quantities]. — Z. f. Anal. Chem., 150, pp. 100—110, 3 text-figs. München 1956.

Koczy, Fritz F., Tomic, Ernst & Hecht, Friedrich: Zur Geochemie des Urans im Ostseebecken [On the geochemistry of uranium in the Baltic]. — Geochim. et Cosmochim. Acta, 11, pp. 86—102, 4 text-figs. English abstract p. 86. Belfast 1957.

Krey, Johannes: Ergebnisse eines hydrographisch-produktionsbiologischen Längsschnittes durch die Ostsee im Sommer 1956. III. Die Verteilung des Gesamtphosphors [Results of a hydrographic and production-biological longitudinal section through the Baltic in the summer 1956. III. The distribution of total phosphorus]. — Kieler Meeresf., 13, pp. 202—211, 1 plate. English summary p. 210. Kiel 1957.

KÄÄRIK, KALJO: Determination of uranium, especially in shale and kolm. — Suomen Kemistilehti, B 29, pp. 1—2. Helsinki 1956.

The methods described have been worked out at the Royal Institute of Technology, Stockholm, for Swedish alum shale and kolm. *WL.*

LANDERGREN, STURE: Kemisk malmprospektering [Chemical prospecting]. — TT, 87, pp. 477—478. Norrköping 1957.

Brief review of a lecture given before the Society of Chemical Technics on the 1st of April, 1957. *WL.*

LANDERGREN, STURE [S. L.]: Kemisk prospektering [Chemical prospecting]. — SKT, 69, p. 280. Stockholm 1957.

Summary of the same lecture as mentioned above. *WL.*

LANDERGREN, STURE: Om geokemisk prospektering av malmer [On geochemical prospecting of ores]. — IVA, 28, pp. 305—317, 13 text-figs. Stockholm 1957.

Maps are published showing the content of tungsten in samples of top soil in the vicinity of the Yxsjö tungsten mine and of manganese in samples of till in an area south of the Långban mine, Central Sweden. *WL.*

LANDERGREN, STURE: Preliminary note on the isotopic composition of carbon in some Swedish rocks. — GFF, 79, pp. 274—275. Stockholm 1957.

LARSON, T. E. & HETTICK, IRENE: Mineral composition of rainwater. — Tellus, 8, pp. 191—201, 10 text-figs. Stockholm 1956.

LODGE JR., JAMES P. & TUFTS, BARBARA J.: Techniques for the chemical identification of micron and submicron particles. — Tellus, 8, pp. 184—190, 5 text-figs. Stockholm 1956.

LUNDBLAD, KARL: Mikroelementforskningens historia i Sverige [History of researches concerning trace elements in Sweden]. — SJF, Medd. 60—64, pp. 5—37. English summary pp. 29—30. Stockholm 1956.

MATTSON, SANTE & KOUTLER-ANDERSSON, ELISABETH: Geochemistry of a raised bog. II. Some nitrogen relationships. — KLA, 22, pp. 219—224. Uppsala 1956.

MORDY, W. A.: Report on the third annual conference on Atmospheric Chemistry, May 28—30, 1956. — Tellus, 9, pp. 127—134. Stockholm 1956 (1957).

MOSBY, HAAKON: The Scandinavian programme during the I. G. Y. concerning the CO_2 cycle. — Chronique de l'Union Géodésique et Géophysique Internationale, 1, pp. 72—73. 1957.

PANETH, F. A.: Beiträge der Isotopenforschung zur Chronologie der Welt [Contributions of the isotope research to the chronology of the world]. — SKT, 69, pp. 257—279, 6 text-figs. Stockholm 1957.

PARWEL, A., RYHAGE, R. & WICKMAN, FRANS E.: Natural variations in the relative abundances of the nitrogen isotopes. — Geochim. et Cosmochim. Acta, 11, pp. 165—170. Belfast 1957.

Parwel, A., v. Ubisch, H. & Wickman, F. E.: On the variations in the relative abundance of boron isotopes in nature. — Geochim. et Cosmochim. Acta, 10, pp. 185—190, 1 text-fig. Belfast 1956.

Rasmuson, Anders (A. R.): Några nya kemiska apparater och operationer [Some new chemical apparatus and operations]. — SKT, 68, pp. 324—325. Stockholm 1956.

In this summary of a lecture also the extractive crystallization is briefly mentioned. *WL.*

Revelle, Roger & Suess, Hans E.: Carbon dioxide exchange between atmosphere and ocean and the question of an increase of atmospheric CO_2 during the past decades. — Tellus, 9, pp. 18—27, 2 text-figs. Stockholm 1956 (1957). Also as Contr. fr. the Scripps Inst. of Oceanogr., 900.

Rynninger, Roland: Mode of occurrence of uranium in Swedish black shales. Preliminary investigations. — GFF, 79, pp. 88—90. Stockholm 1957. Also in Reports from the Swedish Society for Clay Research, 7.

Sjöström, G.: Jodhalten i svenska vatten [The iodine content in Swedish water]. — Nord. Hygien. Tidskr., 37, pp. 265—282, 3 text-figs. English summary p. 282. Stockholm 1956.

Stenius, Åke S:son: Apparativa aspekter på en spektrofotometers precision [Apparatus aspects of the precision of a spectrophotometer]. — SKT, 68, pp. 157—158. Stockholm 1956.

In this summary of a lecture such measures are particularly taken into consideration which may increase the precision of spectrophotometers, especially the Beckman spectrophotometer. *WL.*

Torell, Per: Determination of iron in dental enamel. — Odont. Tidskr., 65, pp. 20—23. Swedish summary p. 22. Göteborg 1957.

Voipio, Aarno: On the magnesium content in the Baltic. — Suomen Kemistilehti, 30, pp. 84—88, 1 text-fig. Helsinki 1957. Also as Contr. fr. Merentutkimuslaitos (Inst. of Marine Res.), Helsinki, Finland.

de Vries, A. (M. N.): X-ray analytical equipment for rapid and accurate chemical analysis. — SKT, 69, p. 498. Stockholm 1957. (In Swedish).

In a brief summary of a lecture some data are given on an X-ray fluorescence spectrograph constructed at the Philips laboratories. *WL.*

Wickman, Frans E.: The cycle of carbon and the stable carbon isotopes. — Geochim. et Cosmochim. Acta, 9, pp. 136—153. Belfast 1957.

Mineralogy and Crystallography

GENERAL

Bentzen, Rich. F. W.: När isen är het som smält tenn. Under högt tryck har de flesta ämnen helt andra egenskaper än de, som karakteriserar dem här på jordytan [When the ice is hot as molten tin. At high pressure most materials have quite other properties than those characterizing them here on the surface of the earth]. — VoV, 7, pp. 33—36, 6 text-figs. Göteborg 1957.

Popular description of the properties of different materials at high pressures. *WL.*

Bergsman, E. Börje & Travaillé, Jacques: Hårdhetsprovningens dilemma [The problems of hardness testing]. — Värmländska Bergsmannafören. Ann., 1956, pp. 75—103, 9 text-figs. Disc. Wahlström, Lindstrand, Molinder, Weibull, Sunström, Bergsman, Travaillé, Götzlinger, Rask, ibid., pp. 103—121. Filipstad 1956.

Critical examination of the three methods most used by hardness testing (according to Brinell, Rockwell, and Vickers). A new method, called the cone method, is proposed. *OG.*

Bethge, H.: Über ein Elektronenmikroskop mit universeller Anwendbarkeit für Elektronenbeugung [On an electron microscope universally applicable to electron deflection]. — EM, pp. 30—32, 2 text-figs. Uppsala 1957.

Blom, Karl-Johan: Strålningsskador i fasta ämnen [Defects in solids caused by irradiation]. — TT, 87, pp. 1101—1102, 1 portrait, 1 text-fig. Norrköping 1957.

Review of two lectures by A. H. Cottrell on lattice deformations, especially of metals, caused by irradiation with neutrons, atoms or fragments of atoms. *WL.*

Borelius, Gudmund: Aktuella utvecklingslinjer inom naturvetenskapen. Det fasta tillståndets fysik [Current trends in natural science. Solid state physics]. — SNFÅ, 9 (1955), pp. 137—139. Stockholm 1956.

Modern physical aspects of the lattice structure of solids, problems of the study of alloys, electrical, thermal, and magnetic properties of metals, and some modern methods for the study of crystal structures are briefly summarized. *WL.*

Borelius, G.: Om halvledarnas elektriska egenskaper [On the electrical properties of semiconductors]. — Elementa, 40, pp. 153—161, 8 text-figs. Lund 1957.

The mechanism of the electrical conduction of pure perfect single crystals of semiconductors and by small admixtures of appropriate extraneous substances is treated. *WL.*

Borelius, G.: Phenomenological aspects of the resistivity of pure metals. — Can. Journ. Phys., 34, pp. 1336—1341, 4 text-figs. Disc. Pines, Mott, Aigrain, Joffé, MacDonald, ibid., p. 1341. Ottawa 1956.

Boström, Kurt: A graphical method for the calculation of $/F/^2$ and $/F/$ rom equi-inclination Weissenberg photographs. — AC, 10, pp. 477—479, 1 ext-fig. Copenhagen 1957.

Bowden, F. P.: Fasta kroppars friktion [Friction of solids]. — TT, 86, pp. 25—131, 12 text-figs. Norrköping 1956.

A summary is given of recent investigations as to mechanism of friction of metallic nd non-metallic solids, surface temperatures at sliding, friction at high velocities and igh temperatures and rolling friction. *WL.*

Bäcklund, Birger: Gittermodell till fältelektronmikroskopet [Lattice model for the field electron microscope]. — Elementa, 39, pp. 19—22, 4 text-figs. Lund 1956.

Describes a model of the lattice of the wolfram metal which facilitates the understanding of the origin of the most common emission image in the field electron microscope of Erwin Müller. *WL.*

Cederlund, J.: On the use of thin crystals in scintillation spectroscopy of γ-rays. — KVA, Arkiv f. Fys., 11, p. 104. Uppsala 1956.

Cosslett, V. E. & Duncumb, P.: A scanning microscope with either electron or X-ray recording. — EM, pp. 12—14, 4 text-figs. Uppsala 1957.

Danielson, Allan: A new method for spectrochemical analysis of powderable minerals. — CMJ, 78: 11, p. 105. Ottawa 1957.

Danielsson, Allan: Några synpunkter på användningen av Norelco-diffraktometern för kvantitativa fasbestämningar [Some points of view as to the use of the Norelco diffractometer for quantitative phase determinations]. — GFF, 78, pp. 131—140, 2 text-figs. English abstract p. 131. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 5.

Engström, A. (A. E.): First International Symposium on X-ray Microscopy and Microradiography. — SKT, 68, pp. 501—502. Stockholm 1956.

Engström, Arne: X-ray micrography. Analysis of elements by microtechniques utilizing absorption emission and scattering of X-rays. — Symposium on trace analysis, New York Acad. of Med. 1955, pp. 493—513, 16 text-figs. Disc. Liebhafsky, Dunlap, Engström, ibid., pp. 514—517. New York 1957.

Engström, Arne & Parrish, William: Modern x-ray chemical analysis. II. X-ray absorption and fluorescence. — SKT, 68, pp. 445—454, 6 text-figs. Stockholm 1956.

Fischmeister, H.: Contribution to discussion after a lecture by Georg-Maria Schwab: Ausgewählte Festkörper-Reaktionen [Selected reactions of solids]. — Trabajos de la TRI, 1, p. 628. Madrid 1957.

Haeffner, E., Sjöborg, Th. & Lindhe, S.: The isotope effect of a direct electric current through liquid and solid metals. — Z. f. Naturforschung, 11 A, pp. 71—75, 4 text-figs. Tübingen 1956.

Haine, M. E. & Page, R. S.: A new universal electron microscope of high resolving power: Metro-Vick Type EM6. — EM, pp. 32—34, 1 text-fig. Uppsala 1957.

Hanszen, K.-J.: Der Einfluss von Temperatur, Unterlage und Bedeckung auf die Veränderung elektronenmikroskopischer Präparate [Influence of temperature, substratum, and covering on the alteration of electron microscopic slides]. — EM, pp. 79—83, 8 text-figs. Uppsala 1957.

Hedvall, J. A.: Contribution to discussion after a lecture by H. Forestier: Influence des gaz adsorbés sur la réactivité et la stabilité du réseau cristallin superficiel [Influence of adsorbed gases on reactivity and stability of the superficial crystal lattice]. — QPCM, p. 533. Bruxelles 1956.

Hedvall, J. A.: Contribution to discussion after a lecture by W. A. Weyl: Application of the screening theory to chemical reactions involving nonmetallic solids. — QPCM, pp. 448—449. Bruxelles 1956.

Hedvall, J. Arvid: Current problems of heterogeneous catalysis. — Advances in catalysis and related subjects, 8, pp. 1—15, 14 text-figs. New York 1956.

Hedvall, J. A.: Diffusion in einigen Oxydsystemen [Diffusion in some oxide systems]. — Warmfeste und korrosionsbeständige Sinterwerkstoffe. Vorträge, gehalten auf dem 2. Plansee Seminar »De re metallica», 19. bis 23. Juni 1955, Reutte/Tirol, pp. 1—7, 4 text-figs. Reutte 1956.

Hedvall, J. Arvid: État actuel et évolution des recherches et de l'application technique dans le domaine de la réactivité des corps solides [Actual state and progress of researches and technical application in the sphere of reactivity of solids]. — QPCM, pp. 479—489. Bruxelles 1956.

Hedvall, J. Arvid: L'influence de l'humidité atmosphérique sur processus de trituration et de séparation dans les solides [Influence of atmospheric humidity on processes of trituration and separation of solids]. — Bull. Soc. Chim. France, 1957, pp. 991—994, 10 text-figs. Paris 1957.

Hedvall, J. Arvid: Olösta frågor rörande inflytandet av bestrålning samt magnetiska och stökiometriska ändringar på fasta ämnens reaktivitet [Unsolved questions concerning the influence of irradiation as well as magnetic and stoichiometric changes on the reactivity of solids]. — Tidsskr. f. Kjemi, Bergvesen og Metallurgi, 17, p. 49. Oslo 1957.

Short review in Norwegian of a lecture given in the Norwegian Chemical Society, Trondhjem, Norway, in 1957. *WL.*

Hedvall, J. A.: Reactivity in the solid state. Some present results and future aspects, mainly on the practical applicability. — Trabajos de la TRI, 1, pp. 11—20. Madrid 1957.

Hedvall, J. A.: Reactivity in the solid state: Some present results and future aspects mainly relating to its practical applicability. — Journ. of the Soc. of Glass Techn., 40, pp. 405T-412T. Colchester 1956.

Hedvall, J. Arvid: Reaktivität der Feststoffe. Entwicklung und Zukunft, besonders hinsichtlich praktischer Anwendung [Reactivity of solids. Development and future, especially with regard to practical use]. — Vakuum-Technik, 1956, H. 5, 4 pp. Berlin-Charlottenburg 1956.

Hedvall, J. A.: Research and application of the reactivity of solids. — TRI, Resúmenes, p. 3. Madrid 1956.

Hedvall, J. Arvid: The effects of dissolved or adsorbed inactive gases on the reactivity of oxides. — Trans. Brit. Ceram. Soc., 55, pp. 1—12, 21 text-figs. Stoke-on-Trent 1956.

Hedvall, J. Arvid: Über den Einfluss der Luftfeuchtigkeit auf Mahl- und Separierungsvorgänge bei festen Stoffen [On the influence of atmospheric humidity on grinding and separation processes in solids]. — Z. f. anorg. und allgem. Chem., 283, pp. 165—171, 10 text-figs. Leipzig 1956.

Hillert, Mats: The role of interfacial energy during solid state phase transformations. — JKA, 141, pp. 757—789, 11 text-figs. Swedish summary pp. 785—786. Uppsala 1957.

Hägg, Gunnar: Aktuella utvecklingslinjer inom naturvetenskapen. Oorganisk kemi [Current trends in natural science. Inorganic chemistry]. — SNFÅ, 9 (1955), pp. 145—148. Stockholm 1956.

The importance of modern X-ray, neutron, and electron diffraction methods for the determination of crystal structures of solids and for the study of coordination relations in fluids, glass, and gases is particularly emphasized. *WL.*

Hägg, Gunnar: Aktuella önskemål inom svensk naturvetenskaplig forskning. Oorganisk och fysikalisk kemi [Actual needs in Swedish natural science. Inorganic and physical chemistry]. — Svensk Naturvetenskap 1956. SNFÅ, 10, pp. 216—218. Stockholm 1957.

Inter alia the importance of intensified research into structure and chemistry of solids, especially of oxides, is stated. *WL.*

Hägg, G.: Contribution to discussion after a lecture by W. A. Weyl: Application of the screening theory to chemical reactions involving non-metallic solids. — QPCM, pp. 449—450. Bruxelles 1956.

Högfeldt, Erik: On the properties of binary mixtures. II. A method for testing the assumption of compound formation. — Rec. Trav. Chim., 75, pp. 790—795, 3 text-figs. Amsterdam 1956.

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Wilhelmi, Karl-Axel: Die Kristallstruktur von KCr_3O_8 [The crystal structure of KCr_3O_8]. — Naturwiss., 44, pp. 580—581, 1 text-fig. Würzburg 1957.

Zimen, K. E. & Dahl, L.: Die Diffusion von Spaltungs-Xenon aus Uranmetall [The diffusion of fission xenon from uranium metal]. — Z. f. Naturforschung, 12 A, pp. 167—169, 1 text-fig. Tübingen 1957.

Åsbrink, Stig & Magnéli, Arne: Note on the crystal structure of trititanium pentoxide. — ACS, 11, pp. 1606—1607, 1 text-fig. Helsinki 1957.

Åström, Hans U.: Isothermal measurements on the release of energy stored in cold-worked aluminium. — KVA, Arkiv f. Fys., 11, p. 135. Uppsala 1956

Mineral deposits

Aasbø, Knut: Glimt fra noen finske og svenske gruver [Views from some Finnish and Swedish mines]. — T. f. Kjemi, Bergvesen og Metallurgi, 16, pp 34—40, 9 text-figs. Oslo 1956.

In 1954 students at the Technical University of Norway visited some mines in Fin land and Sweden. On account of this excursion some notes were written regarding th mining of the Outokumpu, Vihanti, Boliden, Malmberget, Björkaasen, and Sulitelm mines. *EW.*

ANDERSSON, J. G.: E. T. Nyström och Kinas järnmalmer [E. T. Nyström and the iron ores of China]. — GFF, 78, pp. 347—348. Stockholm 1956.

A reply on account of a lecture on the production of iron formerly and at present in China and a short description of the different types and the most important Chinese iron ores, given by professor E. T. Nyström at the Geological Society of Stockholm. *EW.*

ANON.: An iron ore mine in Sweden. — The Mining Magazine, 96, pp. 86—90, 2 text-figs. London 1957.

ANON.: A picture of world-wide mining. Europe. Sweden. — World Mining, 10: 5, p. 83. San Francisco 1957.

ANON.: Mining at Kristineberg, North Sweden. — The Min. Journ., 248, pp. 10—11, 2 text-figs. London 1957.

ANON.: Mining practice at Langsele, North Sweden. — The Min. Journ., 248, p. 78, 3 text-figs. London 1957.

ANON.: Mining practice at Renström, North Sweden. — The Min. Journ., 247, pp. 458—459, 4 text-figs. London 1956.

ANON.: The world picture in mining. Europe. Sweden. — World Mining, 9: 5, p. 92. San Francisco 1956.

ANON.: The world's mining fields in 1955. Sweden. — The Min. Journ., Ann. Rev., p. 233. London 1956.

ASTLIND, BERTIL & FAHLSTRÖM, P. H.: Greenland lead-zinc mine beats elements with underground mill. — World Mining, 10: 12, pp. 34—38, 11 text-figs. San Francisco 1957.

BERGLUND, CARL-BERTIL: The Kiruna operations. — Mine & Quarry Engineering, 22, pp. 2—10, 46—57, 44 text-figs. London 1956.

BROTZEN, OTTO: Kopparmineraliseringen i Norra Rhodesia och Katanga [The copper mineralization of Northern Rhodesia and Katanga]. — GFF, 79, pp. 225—248, 6 text-figs. English abstract pp. 225—226. Stockholm 1957.

BUCHHEIM, W.: Anwendungen der Methode der induzierten Polarisation an schwedischen Erzlagerstätten [Application of the method of induced polarization to Swedish ore deposits]. — Z. f. Geophys., 23, pp. 26—33, 4 text-figs. Braunschweig 1957. Also as Mitt. aus dem Inst. f. theor. Phys. und Geophys. der Bergakad. Freiberg, 11.

BUCHHEIM, W. & MALMQVIST, D.: Anwendungen der Methode der induzierten galvanischen Polarisation an schwedischen Erzlagerstätten [Application of the method of induced galvanic polarization to Swedish ore deposits]. — XX Congr. Geol. Int. Resumenes de los trabajos presentados, p. 156. Mexico 1956.

DALHAMMAR, SVEN: Nya gruvor. Vad som hänt i Sverige de senaste 10 åren [New mines. What has happened in Sweden during the last 10 years]. — Blad f. Bergshandt. Vänner, 32: II, pp. 63—83, 15 text-figs. Uppsala 1957.

During the last decade the mining of several new-discovered or reinvestigated ores has begun in Sweden. The new mines are: Renström, Långsele, Östra Högkulla, Rudtjebäcken, and Rävliden in the Skellefte ore field (all producing Cu, Zn or Pb), Vassbo and Laisvall (Pb) in the marginal zone of the Caledonian mountains, and Bronäs (Pb, Zn, Ag), Tjällmo (W), Kvarntorp (U), Forsbo, Vingesbacke, Stråssa, Kallmora, Staf, Förola, and Vreta (all Fe) in Central Sweden. *EW.*

De Geer, Gerard: Dalkarlsjön. Några glimtar av Bergslagens natur och historia [Dalkarlsjön. Some glimpses from the nature and history of Bergslagen]. — Bonniers, 152 pp., 3 text-figs., 12 plates. Stockholm 1957.

Chapters on the mines of the mining-field of Värmland and on the transition from bog-ore to rock-ore are of geological interest. *WL.*

Ek, Stig (Ek): Adakfältets malmbas ökar [The ore base of the Adak field is increasing]. — Smältdegeln, 1957: 2, pp. 5—7, 9 text-figs. Skellefteå 1957.

Popular account of the discovery of the copper ores of the Adak field, Västerbotten, the progress of the mining operations, and actual projects. *WL.*

Ek, Stig (Ek): Långselemalm automatiskt till Boliden. Ett reportage om Långsele och transporten i långorten [The Långsele ore automatically to Boliden. A reportage on Långsele and the transportation in the long tunnel]. — Smältdegeln, 1957: 3, pp. 6—10, 13 text-figs. Skellefteå 1957.

Popular account of the pyrite-zinc ore at Långsele near Boliden, Västerbotten, and its mining. *WL.*

Ek, Stig (Ek): Så skall Vassbo byggas ut [Thus Vassbo will be developed]. — Smältdegeln, 1957: 4, pp. 6—8, 7 text-figs. Skellefteå 1957.

The discovery of the lead ore at Vassbo in the parish of Idre, Dalecarlia, its character, and the plans for its mining are described. *WL.*

Eklund, Josef: Kalksten, dolomit och alunskiffer [Limestone, dolomite, and alum shale]. — Atlas över Sverige. Geologi, 13—14, 4 pp., 2 coloured maps. English summary p. 4. Stockholm 1957.

Fernlund, Uno, Zechner, Sepp & Eriksson, Sven-Olof: Fosforprov p järnmalm i fast klyft och i upplag [Test for phosphorus of iron ores in solid rock and in store]. — JKA, 140, pp. 389—391, 1 text-fig. German summary p 391. Uppsala 1956.

Forsström, K.-E. (K.-E. F.): Bergshantering 1955 [Mining industry 1955] — Kommersiella Medd. utg. av Kommerskollegium, 43, pp. 322—323. Stockholm 1956.

Board of Trade summary of the reports of the Swedish mining industry 1955. Th value of the mining products is estimated to 3 770 million Sw. Cr. Two tables with statistical data are included. *EW.*

Forsström, K.-E. (K.-E. F.): Bergshantering 1956 [Mining industry 1956] — Kommersiella Medd. utg. av Kommerskollegium, 44, pp. 405—406. Stockholm 1957.

Board of Trade summary of the reports of the Swedish mining industry 1956. Th value of the mining products is estimated to 4 430 million Sw. Cr. Two tables wit statistical data are included. *EW.*

Forsström, K.-E.: De svenska bergverkens produktion år 1955 [Production of the Swedish mineral industry during 1955]. — Kommersiella Medd. utg. av Kommerskollegium, 43, pp. 146—152. Stockholm 1956.

A preliminary report given by Board of Trade. An increase in the production of iron ore to 17.1 million metric tons is noticed. Thereof 15.5 million metric tons are exported. Three tables comprising the production of the mineral industry 1953—1955 and the production of iron ore and pig iron in the different counties during 1939, 1954, and 1955 are included. *EW.*

Forsström, K.-E.: De svenska bergverkens produktion år 1956 [Production of the Swedish mineral industry during 1956]. — Kommersiella Medd. utg. av Kommerskollegium, 44, pp. 198—204. Stockholm 1957.

A preliminary report given by Board of Trade. A further increase in the production of iron ore to 18.9 million metric tons. The export of iron ore also shows an increase to 17.0 million metric tons. Three tables comprising the production of the mineral industry 1954—1956 and the production of iron ore and pig iron in the different counties during 1939, 1955, and 1956 are included. *EW.*

Garås, Paul: Lagren inom gruv-, järn-, metall- och verkstadsindustrierna 1955 [Stocks in the mining, metal, and engineering industries in 1955]. — Kommersiella Medd. utg. av Kommerskollegium, 43, pp. 217—223. Stockholm 1956.

A report given by Board of Trade. During 1955 the stocks increased on an average 12 %. The value of this increase is estimated to 700 million Sw. Cr. Five tables showing the variations of the stocks of the different industries and the estimated consumption of iron and steel for trade are included. *EW.*

Garås, Paul: Lagren inom gruv-, järn-, metall- och verkstadsindustrierna år 1956 [Stocks in the mining, iron, metal, and engineering industries in 1956]. — Kommersiella Medd. utg. av Kommerskollegium, 44, pp. 238—244. Stockholm 1957.

Board of Trade reports further increase of the stocks with about 11 % during 1956. The value of this increase is about 800 million Sw. Cr. Thereof the value of the stocks of the engineering industry is about 600 million Sw. Cr. Five tables showing the variations of the stocks of the different industries and the estimated consumption of iron and steel for trade are included. *EW.*

Geijer, Per: Die Herkunft der quarzgebänderten Eisenerze. Eine Übersicht der Problemlage [Origin of the quartz-banded iron ores. A survey of the present state of the problem]. — Neues Jb. Mineral. Abh., 91, pp. 223—238. Stuttgart 1957.

Gjelsvik, Tore: Pre-glaciale forvitringsfenomene i kopperforekomster i den syd-vestlige del av Finnmarksvidda [Pre-Glacial weathering phenomena in copper deposits in the SW part of Finnmarksvidda]. — GFF, 78, pp. 659—665, 5 text-figs. English abstract p. 659. Stockholm 1956.

Grip, E.: Nickelförekomsten Lainijaur i Skelleftefältet [The nickel deposit of Lainijaur in the Skellefte mining district]. — NGT, 36, p. 75. Bergen 1956.

An intrusion of a nickel-bearing gabbro in a syncline of sediments has caused the ormation of a nickel ore. In the hanging wall of the phacolith-like gabbro the ore s situated on both sides of a gabbro-filled fissure through which the magma penetrated nto the sediments. *EW.*

Hk: Naturgas i Frankrike [Natural gas in France]. — Sv. Gasverksfören Månadsbl., 24, p. 89. Stockholm 1957.

At Lacq in the south-west of France large deposits of natural gas have been foun at a depth of 3 000—4 000 m. The present production is about 1 million m^3 of crud gas per twenty-four hours. Measures are being taken to multiply the production an for a remote distribution to Lyon and Paris. *EW.*

Hähnel, Sigge (SHl): Atomenergin i de anglosaxiska länderna [The nuclea energy in the Anglo-Saxon countries]. — TT, 87, pp. 909—911. Norrköpin 1957.

A compilation of data regarding the development of the peaceful use of nuclea energy in Great Britain, USA, and Canada and the production of uranium in th Anglo-Saxon countries. The reserves of uranium ore are also estimated. *EW.*

Hähnel, Sigge (SHl): Beryllium [Beryllium]. — TT, 86, pp. 371—374 Norrköping 1956.

A short description of beryllium, its occurrence in the lithosphere, chemical an physical properties, the production of the metal, its alloys, and the use of the meta as moderator in the reactor technique. *EW.*

Höijer, Björn-Erik: Hemma i Malmberget [At home in Malmberget] — STÅ, 1957, pp. 153—168, 5 text-figs. Stockholm 1957.

A literary short story about life in Malmberget containing historical notes on th mining. *EW.*

Isaksson, Vilhelm: Vi måste planera för framtiden [It is necessary to mak preparations for future]. — Jorden, Skogen, Malmen och Vattenkraften Morgondagens Norrbotten [Soil, forest, ore, and water power in Norrbotten to-morrow]. Edited by Folke Thunborg. Published by Föreningen Norrbotten Främjande, pp. 198—199. Stockholm 1956.

In a contribution to the debate about the social aspects of the mining of the iro ores in Norrbotten, Sweden, the author supports the opinion expressed by profess Magnusson. *EW.*

Kihlstedt, P. G.: Tillgodogörande av fattiga malmer. Problem rörande de framtida mineralförsörjningen [Utilization of low grade ores. Problems co cerning the future supply of minerals]. — JKA, 141, pp. 1—27, 15 text-fig English summary p. 26. Uppsala 1957. Also in Medd. fr. Sv. Gruvfören., 7 Disc. Schwartz, Wijkander, Kihlstedt, Magnusson, Berglund, Janelid, Rotheliu pp. 27—41, 7 text-figs.

Kommerskollegium: Bergshantering. Berättelse för år 1956 [Metal an mining industries. Report for the year 1956]. — Sveriges Officiella Statisti Industri och Bergshantering, 79 pp. English summary pp. 10—11. Stock holm 1957.

Lannerbro, Ragnar: Något om blästor och myrjärn i Venjan [A few not on blast-furnaces and bog-iron in Venjan]. — Venjans församling 350 år, p 229—244, 8 text-figs. Falun 1957.

Description of the occurrence of bog-ore in the parish as well as methods for i gathering and roasting and the production of bog-iron. *WL.*

LINDROTH, GUSTAF T.: Ur Garpenbergs gruvors historia. Tekniska, geologiska och ekonomiska data ur Garpenbergs sulfidmalmsbergsbruks historia, sammanställda i anledning av Ryllshytte gruvors nedläggande år 1951 [From the history of the Garpenberg mines. Technical, geological, and economical data from the history of the sulphide-ore mining at Garpenberg, compiled on account of the cessation of the Ryllshyttan mines in 1951]. — Blad f. Bergshandt. Vänner, 32: II, pp. 385—436, 16 text-figs. English summary pp. 426—429. Uppsala 1957.

LJUNGGREN, P.: Mullmalmen vid Värmlands Taberg [The soft iron ore at Värmlands Taberg]. — NGT, 36, p. 78. Bergen 1956.

An investigation of the mineral composition of the soft iron ore (Swedish: mullmalm) and the clay-weathered country rock has been carried out by means of DTA and X-ray analysis. The iron ore has been transformed to goethite; some data indicate two modifications of goethite. The skarn rich in magnesia now appears as an antigorite rock and the acid country rocks (gneiss and leptite) have been kaolinized. *EW.*

LÖWENHIELM, HALVAR: Hofors gruvor [The Hofors mines]. — Hofors bruks historia, pp. 443—476, 10 text-figs., 2 plates. Göteborg 1957.

For a number of iron mines in the Torsåker mining district (the Nyäng, Storstreck, and Vingesbacke mines) and in the parish of Ljusnarsberg (the Skött and Moss mines), an account is given of character, shape, and dimensions of the ore bodies as well as mining methods and production capacity. *WL.*

MAGNUSSON, NILS H.: Malmreserverna måste inventeras [The ore reserves have to be surveyed]. — Jorden, Skogen, Malmen och Vattenkraften i Morgondagens Norrbotten [Soil, forest, ore, and water power in Norrbotten of tomorrow]. Edited by Folke Thunborg. Published by Föreningen Norrbottens Främjande, pp. 151—169, 4 text-figs. Stockholm 1956.

In a lecture the author estimates the reserves of iron ore in the Norrbotten county o 2 413 million metric tons with an iron content of 1 532 million tons. The largest ore fields are situated in Kiruna (1 600 million tons) and Gällivare (428 million tons). Outside these areas smaller ores of the same type occur and the total quantity of them s estimated to 109 million tons. The reserves of the skarn ore type, which also is repreented in the area, are about 183 million tons. Except the iron ores, only few other ores are known in the area. The most important is the lead ore at Laisvall. *EW.*

MAGNUSSON, NILS H.: Outforskade tillgångar [Unexplored resources]. — Norrland. Förutsättningar och problem [Norrland. Conditions and problems], pp. 15—26, 4 text-figs. Malung 1957.

A brief outline of the ore and mineral deposits of Norrland is given and the possibilities of making new ore finds are emphasized. *WL.*

MAGNUSSON, NILS H.: Problemet har också en social sida [The problem has also a social aspect]. — Jorden, Skogen, Malmen och Vattenkraften i Morgondagens Norrbotten [Soil, forest, ore, and water power in Norrbotten of tomorrow]. Edited by Folke Thunborg. Published by Föreningen Norrbottens Främjande, pp. 194—195, 1 text-fig. Stockholm 1956.

In a contribution to a discussion the author calls attention to the social problems f the exploitation of the iron ores in the Norrbotten county. *EW.*

Magnusson, N. H.: Sveriges geologiska undersöknings malm- och oljeletning [The prospecting for ore and oil of the Geological Survey of Sweden]. — Värml. Bergsmannaflören. Ann., 1956, pp. 13—40, 6 text-figs. Disc. Eriksson, Magnusson, ibid., pp. 40—41. Filipstad 1956.

The history of the Geological Survey and its prospecting is described. The author calls attention to the ores that have been localized in the Västerbotten and Norrbotten counties and in the Caledonian mountains. Moreover he deals with the oil- and uranium bearing alum shales and the prospecting for oil in the South of Sweden. *EW.*

Mattsson, Åke: Världens järnmalmstillgångar och deras utnyttjande [The iron-ore resources of the world and their exploitation]. — Geogr. Notiser, 14: 1, pp. 14—20, 1 text-fig. Stockholm 1956.

A summary of the iron-ore types is given together with statements of iron-ore production in different countries and some aspects of current problems and trends of development. *WL.*

Meissel, G. H. E.: Gewinnung und Verwertung von Ölschiefer in Kvarntorp (Schweden) [Exploitation and dressing of oil shale at Kvarntorp (Sweden)]. — Erdöl und Kohle, 9, p. 34. Hamburg 1956.

Nilsson, Lennart: I Dannemora gruva. En bildsvit [In the Dannemora mine. Some photographs]. — STÅ, 1957, pp. 169—176, 9 text-figs. Stockholm 1957.

The photographs illustrate the present activity in this old iron mine. *EW.*

Norén, Bertil: Bolidenbolagets verksamhet i Norrbotten [The work of the Boliden Co. in Norrbotten]. — Jorden, Skogen, Malmen och Vattenkraften Morgondagens Norrbotten [Soil, forest, ore, and water power in Norrbotten o to-morrow]. Edited by Folke Thunborg. Published by Föreningen Norrbotten- Främjande, pp. 179—188, 4 text-figs. Stockholm 1956.

The author mentions in a lecture that an extensive geological work has been made This work has shown that the old mines at Nasafjäll are not mineable. At the end o the nineteen-thirties the lead ore at Laisvall was found. The mine now produce 500 000 metric tons of ore per year. *EW.*

Norin, Rolf [A. Å.]: Skånes naturtillgångar [The natural resources o Scania]. — SKT, 69, pp. 343—344. Stockholm 1957.

Brief summary of a lecture given in 1957 at a meeting of the Hälsingborg section of the Swedish Chemical Association. *WL.*

Nyström, Erik T.: Malmgeologiska expeditionen till Kina 1914. Svenska in satser i Kina på det malmgeologiska området [The economic geological expedi tion in China in 1914. Swedish contributions to Chinese ore geology]. — Dae dalus. Tekn. Mus. Årsb. 1956, pp. 141—147. Stockholm 1956.

The author describes the foundation of the university of Shansi, the Swedish co operation in the organisation of the Geological Survey of China, and the prospectin work. Finally a short description is given of the hematitic iron ore at Hsuan Lung about 10 miles NW of Peking. *EW.*

Pihlström, Clas: Det sägenomspunna gruvfältet vid Nordmarksberg [The old mining-field of Nordmarksberg]. — Värmland vår hembygd 1957, pp. 112—115, 4 text-figs. Karlstad 1957.

A brief popular account of the history of the iron-ore mining in the Nordmarksberg area, Värmland. *WL.*

Pilava-Podgurski, Nikolai: Lövås gruva [The Lövås mine]. — GFF, 79, pp. 179—194, 7 text-figs. English abstract p. 179. Stockholm 1957.

Schmoll, Karl: Narvik conveyors sort, mix and load Sweden's ores. — EMJ, 158: 6, pp. 92—94, 11 text-figs. New York 1957.

Serning, Boris: Exploateringstakten inte endast en social fråga [The speed of exploitation is not only a social question]. — Jorden, Skogen, Malmen och Vattenkraften i Morgondagens Norrbotten [Soil, forest, ore, and water power in Norrbotten of to-morrow]. Edited by Folke Thunborg. Published by Föreningen Norrbottens Främjande, pp. 196—197. Stockholm 1956.

A reply to professor N. H. Magnusson about the social problems at the exploitation of the iron ores in the Norrbotten county. *EW.*

Serning, Boris: Malmbrytningens rationalisering [The rationalization of the mining work]. — Jorden, Skogen, Malmen och Vattenkraften i Morgondagens Norrbotten [Soil, forest, ore, and water power in Norrbotten of to-morrow]. Edited by Folke Thunborg. Published by Föreningen Norrbottens Främjande, pp. 170—178, 2 text-figs. Stockholm 1956.

A lecture on the possibilities of making the mining of the large iron ores at Kiruna and Gällivare more effective. *EW.*

Statistiska Centralbyrån: Bergshantering [Mines and quarries]. — Statistisk Årsb. f. Sverige, 43, pp. 113—114. English translation. Stockholm 1956.

Statistiska Centralbyrån: Bergshantering [Mines and quarries]. — Statistisk Årsb. f. Sverige, 44, pp. 111—112. English translation. Stockholm 1957.

Sundius, Nils: Runmarö kalksten och Runmarö gamla kalkbruk [The limestone and the old lime-work of Runmarö]. — GFF, 78, pp. 316—328, 4 text-figs. English abstract p. 316. Stockholm 1956.

Svenke, Erik: The occurrence of uranium and thorium in Sweden. — United Nations. Proc. of the Int. Conf. on the Peaceful uses of Atomic Energy held in Geneva 8 August — 20 August 1955, 6, pp. 198—199. New York 1956.

Söderberg, Sten: Där var guld i berget [It was gold in the rock]. — STÅ, 1957, pp. 245—261, 8 text-figs. Stockholm 1957.

A literary short story about the ores of precious metals. *EW.*

Söderlund, Ernst: Bergsbruk och samhälle [Mining and community]. — STÅ, 1957, pp. 145—152. Stockholm 1957.

A literary short story about the mining and the community in Sweden. *EW.*

Taylor, Frank: Oljeberget i Colorado [The oil rock of Colorado]. — Det Bästa, 15: 8, pp. 60—64, 2 text-figs. Stockholm 1957.

A popular account of the oil-bearing shales in N.W. Colorado. The resources are estimated to $960 \cdot 10^9$ barrels of oil. The investment for a production of 30 000—35 000 barrels per day amounts to $ 300 million. *EW.*

Tegengren, F. R.: Järnframställning i Kina förr och nu jämte en kortfattad beskrivning av Kinas viktigaste järnmalmer och deras olika typer [Iron production in China formerly and at present with a short description of the different types of the most important Chinese iron ores]. — GFF, 78, pp. 178—180. Stockholm 1956.

A reply on account of a lecture given by professor E. T. Nyström in 1955 at a meeting of the Geological Society of Stockholm. *EW.*

Torbrand, Dagny: Stux i Bunge — en nordgotländsk »gard». En kulturgeografisk studie [Stux in Bunge — a farm in Northern Gotland. A study in human geography]. — SGÅ, 32, pp. 90—118, 8 text-figs. English summary pp. 116—118. Lund 1956. Also as Medd. fr. Lunds Univ. Geogr. Inst., 348.

The geology and particularly the limestone quarrying are also taken into consideration. *WL.*

Törnqvist, G.: Geophysical history of the iron mine at Forsbo, Sweden. — Geophysics, 22, p. 749. Tulsa 1957.

Tornquist, G.: Geophysikalische Geschichte der Eisenerz-Grube Forsbo, Schweden [Geophysical history of the Forsbo iron ore mine, Sweden]. — Erdöl und Kohle, 10, p. 619. Hamburg 1957.

Trafikaktiebolaget Grängesberg-Oxelösund: 54 år i Lappland. Om Luossavaara-Kiirunavaara Aktiebolag 1903—57 [54 years in Lapland. On the Luossavaara-Kiirunavaara Co. 1903—57].— 142 pp., 113 text-figs. Stockholm 1957. Also English and German editions.

Ventura, E.: Visite de quelques mines de Suède centrale [Visit at some mines in Central Sweden]. — Ann. des Mines, 145: 6, pp. 47—58, 19 text-figs. Paris 1956.

Waldén, Bertil: Ett Smålands mirakel [A miracle in Småland]. — STÅ, 1957, pp. 177—185, 3 text-figs. Stockholm 1957.

A literary short story about the iron ore in Taberg. *EW.*

Walldén, Sven: Blyframställning inom Bolidens Gruv AB [Lead production of the Boliden Mining Co.]. — TT, 86, pp. 569—576, 11 text-figs. Norrköping 1956.

A short review of the occurrence of lead ores in Sweden and a description of the method used at the Boliden Mining Co. for the production of the metal from high-grade lead ore concentrates. *EW.*

Walldén, Sven (S. W.): Blyframställning vid Bolidens Gruvaktiebolag [The output of lead at the Boliden Mining Co.]. — SKT, 68, pp. 249—250. Stockholm 1956.

The Swedish consumption of lead is provided by the mines at Laisvall and Garpenberg. Considerable reserves of lead ore are known in the Caledonian mountains. In the works at Rönnskär an electric melting method has been developed for the treatment of high-grade lead ore concentrates. A description of these new methods is given in a lecture at Svenska Teknologföreningens Avdelning för Kemi och Bergsvetenskap. *EW.*

Whalen, Einar: Ravings about gold in Sweden. — Rocks and Minerals, 31, p. 284. Peekskill 1956.

Wiedesheim-Paul, Gösta: Undersökning av uranfyndigheter. Olika problem i samband med koncessionsgivningen [Investigation of uranium deposits. Different problems in connection with the granting of concessions]. — Från Departement och Nämnder, 19, pp. 65—69. Stockholm 1957.

At the end of 1956 eighty concessions for the investigation of uranium indications were applied. Some juridical problems which arose in connection with the granting of these concessions are discussed. *EW.*

Wolfert, Ira: Olja under havet [Oil under the sea]. — Det Bästa, 15: 9, pp. 31—38, 2 text-figs. Stockholm 1957.

The oil-drilling on the continental shelf in the northern part of the Gulf of Mexico is popularly described. *EW.*

Ödman, Olof H.: Iron and manganese ores of Brazil. — Engenharia, Mineração e Metalurgia, 23, pp. 219—221. Rio de Janeiro 1956.

Applied Geology

A., A.: Aktuellt om silikos [Actual research work on silicosis]. — Stenarbetaren, 1956: 1, p. 14. Uddevalla 1956.

An account of the occurrence of silicosis in Sweden during the years 1931—1954. About 2 000 persons got this disease and 350 persons died. Many of the cases have been established at iron-works and mines but in relation to the number of persons working the most serious cases were found among those who were engaged in quarrying and crushing quartz and polishing sandstone. *HT.*

Ahlborg, G.: Asbestos [Asbestosis]. — Nord. Med., 55, pp. 478—479. Hälsingborg 1956.

Short description of origin and development of the disease which is caused by the inhalation of asbestos fibres. *WL.*

Ahlborg, Gunnar & Hansson, Carl-Johan: Asbestos. En för Sverige ny yrkessjukdom [Asbestosis. An occupational disease new for Sweden]. — Sv. Läkartidn., 53, pp. 1376—1383, 2 text-figs. Stockholm 1956.

On account of 9 cases of asbestosis in Gothenburg a brief summary is given of the conditions of origin of the disease, its clinical treatment, and prophylaxis. *WL.*

Ahlmark, A., Bruce, T. & Nyström, Å.: Några industrier med föga beaktad silikosrisk [Some industries with silicosis risks to which little attention has been paid]. — Arbetarskyddet, 45, p. 120. Stockholm 1957.

The risks of pneumoconiosis at the manufacture of crucibles in the glass industry, at the crushing of limestone with interstratified flint, and at work with diatomaceous earth and soapstone are emphasized. *WL.*

Ahlmark, A., Bruce, T. & Nyström, Å.: Om silikosen som yrkessjukdom i Sverige [On the silicosis as an occupational disease in Sweden]. — Nord. Med., 55, p. 926. Disc. Norviit, Ahlmark, ibid., p. 926. Hälsingborg 1956.

Brief summary of a lecture in the Swedish Medical Association on the 18th of October, 1955. *WL.*

Ahlmark, A., Bruce, T. & Nyström, Å.: Silicosen som yrkessjukdom i Sverige [Silicosis as an occupational disease in Sweden]. — Nord. Med., 55, pp. 252—257, 6 text-figs. English summary p. 257. Hälsingborg 1956.

Ahlmark, Axel, Bruce, Torsten, & Nyström, Åke: Silicosis mortality in Sweden. — Opuscula Medica, 1, pp. 264—268. Stockholm 1956.

Ahlmark, Axel, Bruce, Torsten & Nyström, Åke: Silikosen i Sverige ett socialmedicinskt problem. Återblick — dagsläge — önskemål [The silicosis in Sweden a social medical problem. Retrospect — present situation — desiderata]. — Socialmed. Tidskr., 34, pp. 319—329. Stockholm 1957.

An investigation of the silicosis situation in Sweden shows that risk for silicosis is still existent and that the medical silicosis control must be maintained and in certain respects increased. *WL.*

Ahlmark, A., Bruce, T. & Nyström, Å.: Silikos hos kvartsarbetare i Sverige [Silicosis among quartz workers in Sweden]. — Sv. Läkartidn., 53, pp. 925—933, 5 text-figs. Stockholm 1956.

The symptoms of silicosis and its present occurrence in different groups of craftsmen in Sweden are dealt with. *WL.*

Ahlmark, A., Bruce, T. & Nyström, Å.: Silikos vid krossning av kalksten med inlagrad flinta [Silicosis from crushing of limestone with flint deposits] — Nord. Hygien. Tidskr., 38, pp. 195—197, 1 text-fig. English summary p 197. Stockholm 1957.

Ahlmark, Axel & Öhman, Harry: Dammätningar i silikosförebyggande syfte [Dust measurements aiming at preventing silicosis]. — TT, 86, pp. 889—895, 6 text-figs. Norrköping 1956.

Different methods of measurement are evaluated and an estimate is made of the connection between the number of quartz particles in dust and the risk of silicosis *WL.*

Ahlmark, Axel & Öhman, Harry: Health hazards in foundries and their prevention. With special reference to silicosis, carbon monoxide poisoning and heat affection. — 24th Int. Foundry Congr. Stockholm, 19—24 VIII 1957 1, pp. 1—27, 7 text-figs., 2 portraits. French summary pp. 2—3. German summary p. 3. Stockholm 1957. Disc. Nilsson, Ahlmark, Gustafsson, Skard Dietert, Krogvig, ibid., 3, pp. 737—739. Stockholm 1958.

Ahlmark, Axel & Öhman, Harry: Silikos och silikosbekämpning [Silicosis and silicosis combating]. — Fören. f. Arbetarskydd, 183 pp., 34 text-figs Lidingö 1957.

The history, origin, symptoms, and treatment of silicosis, its occurrence in Sweden in different works, and its prevention are thoroughly dealt with. *WL.*

ANON.: A instalação de enriquecimento de minério de ferro da Lapônia [The concentrating works for the iron ores of Lapland]. — Engenharia, Mineração e Metalurgia, 25, pp. 181—182, 1 text-fig. Rio de Janeiro 1957.

ANON.: Arctic iron ore plant starts operation. Kiruna facility will have 4600 tph capacity. — Mining Engineering, 9, p. 407, 1 text-fig. New York 1957.

ANON.: Drilling and scaling from a fork-lift truck. A note on practice at the Laisvall lead mine, Sweden. — Mine & Quarry Engineering, 22, pp. 22—23, 4 text-figs. London 1956.

ANON.: From Scandinavia — Two novel methods for stronger roof support. II. In Sweden, the method is simple. — EMJ, 157: 9, pp. 80—81, 7 text-figs. New York 1956.

ANON.: Gjutare-offensiv mot silikossjukdom [A founder offensive against silicosis disease]. — Arbetarskyddet, 45, p. 81, 1 text-fig. Stockholm 1957.

For the prevention of silicosis in foundries it is recommended material containing quartz to be replaced by *e. g.* olivine sand. *WL.*

ANON.: Higher specific weights are now realized through the newly-developed Swedish sink-float method which gives better ore separation. — The Mines Magazine, 46: 10, pp. 29, 32, 1 text-fig. Denver 1956.

ANON.: Huge Swedish iron plant opens at Kiruna fields. — World Mining, 10: 4, p. 45. San Francisco 1957.

ANON.: In Sweden — new building houses, hoists and dry mill.— World Mining, 10: 6, p. 33, 1 text-fig. San Francisco 1957.

ANON.: Iron-ore mining in Lapland. Open-cast production is giving way to underground techniques. — Iron and Coal Trades Rev., 174, pp. 723—730, 9 text-figs. London 1957.

ANON.: Large capacity Swedish mine hoists. — CMJ, 77: 7, pp. 84—85, 1 text-fig. Ottawa 1956.

ANON.: Marmor. En aktuell naturindustri på månghundraårig grund [Marble. A natural industry of current interest founded many hundred years ago]. — Stenarbetaren, 1956: 3, pp. 8—11, 13 text-figs. Uddevalla 1956.

A description of the technics of quarrying and working of marble. Brief history of the marble-works. *HT.*

ANON.: Mining near the Arctic Circle. Metal extraction and refining at Boliden. — Iron and Coal Trades Rev., 174, pp. 973—977, 6 text-figs. London 1957.

ANON.: New Swedish tunnel record. — CMJ, 77: 12, p. 70. Ottawa 1956.

ANON.: The biggest ore dressing plant in the world. — The Min. Journ., 248, pp. 402—403, 4 text-figs. London 1957.

Anon.: Trängslet i Österdalälven. Ett kraftverksprojekt [Trängslet in the river Österdalälven. A power-plant project]. — Bergslaget, 11: 4, pp. 2—14, 18 text-figs. Stockholm 1956.

The geological conditions at the place of the power plant projected are also briefly dealt with. *WL.*

Anon.: Tunnelling records. The Ume River project, Sweden. — The Min. Journ., 247, p. 624, 1 text-fig. London 1956.

Anon.: Uranprospekteringen [The uranium prospecting]. — Bergslaget, 11: 3, p. 34. Stockholm 1956.

Report from the uranium prospecting of St. Kopparbergs Bergslags Aktiebolag in eastern Middle Sweden. *WL.*

Anon.: World's biggest ore dressing plant helps double Lapland iron ore output. — CMJ, 78: 3, pp. 82—83, 1 text-fig. Ottawa 1957.

Asp, Rune: Vägarna och tjälen [The roads and the frost]. — Kommunaltekn. Tidskr., 23, pp. 140—144, 6 text-figs. Stockholm 1957.

Factors influencing the rate of the frost heaving, frost heaving by water absorption to the frost depth, and measures for reducing the frost heaving are dealt with. *WL.*

Bergfelt, Allan: Geoteknik och grundläggning vid Göteborgs hamn [Geotechnics and foundation at the port of Gothenburg]. — Väg- och vattenbyggaren, 2, pp. 27—32, 14 text-figs. Stockholm 1956.

Report on investigations during the last years as to ground research methods, problems of settling, and foundation on plates in clay. *WL.*

Bergfelt, A.: The axial and lateral load bearing capacity, and failure by buckling of piles in soft clay. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, 2, pp. 8—13, 8 text-figs. French summary p. 8. London 1957.

Berglund, E.: Tillverkning av gödsel- och kalkningsmedel [Production of fertilizers and lime]. — HV, 6, pp. 1—36, 61 text-figs. Stockholm 1956.

The natural mode of occurrence of the raw materials of the most important fertilizers and other means for soil-improvement as well as the processes of manufacturing are described. *WL.*

Bergman, Sten G. A.: Noggrann utsprängning av bergrumssektioner genom s. k. slätsprängning [Exact blasting-out of rock chambers through smoothing]. — Byggmästaren, B, 36, pp. 85—89, 7 text-figs. English summary in the announcements section p. 21. Stockholm 1957.

Bernell, L. & Nilsson, R.: Electrical analogy equipment for solving non-stationary two-dimensional flow problems. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, pp. 291—293, 3 text-figs. French summary p. 291. London 1957.

Björling, G.: Leaching of manganiferous limonite. — EMJ, 158: 11, p. 82. New York 1957.

Björling, G.: Reductive leaching of ore, especially manganese ores. — CMJ 78: 11, p. 105. Ottawa 1957.

Björk, John: Bana och byggnader. Geoteknik [Railway-line and buildings. Geotechnics]. — Sveriges Järnvägar hundra år. Minnesskrift utgiven av Kungl. Järnvägsstyrelsen med anledning av Statens Järnvägars 100-årsjubileum 1/12 1956 [The Swedish railways one hundred years old. Memorial published by the Board of Management of the State Railways on account of the centenary of the State Railways on the 1st of December 1956], pp. 242—245. Stockholm 1956.

The history and problems concerning frost uplift, slides, and supply of macadam and natural gravel are briefly mentioned. *HT.*

Boije af Gennäs, Madeleine & Lidbeck, Bull: Keramikhandboken [The handbook of ceramics]. — P. A. Norstedt & Söners Förl., 189 pp., 126 text-figs., 26 plates. Stockholm 1957.

Deals *inter alia* with the raw materials of ceramic pastes (clays, meagering and fluxing materials, etc.) and enamels and gives a comprehensive description of ceramic working methods. *WL.*

Bolin, Lorentz: Utdikad civilisation [Drained civilization]. — Bygd och Natur. Tidskr. f. Hembygdsvård, 38, pp. 181—182. Malung 1957.

A summary of a publication with the same title written by Ph. Wolf. *HT.*

Bolin, Lorentz: Vattenproblemet [The water problem]. — Bygd och Natur. Tidskr. f. Hembygdsvård, 37, pp. 41—53, 5 text-figs. Malung 1956.

A popular science paper dealing with Swedish and German problems concerning water supply, waste disposal, and conservation. *HT.*

Boman, Siri: Kalkbrott och kalkbruk i Offerdal [Limestone quarries and lime works in Offerdal]. — En bok om Offerdal av offerdalingar, 1, pp. 375—376. Uppsala 1957.

Brief popular description. *WL.*

Borgström, Hans: Stenhandboken, en handbok för arkitekter och byggnadstekniker [The stone handbook, a manual for architects and constructional technicians]. — 108 pp., 122 text-figs., appendix with 48 figs. in colours. Stockholm 1957.

Besides a geological survey by C.-O. Morfeldt (pp. 10—15), the book contains an account of some Swedish rocks, their properties, quarrying, working, and surface treatment as well as their application in architecture. *WL.*

Broberg, K. B.: Shock waves in elastic and elastic-plastic media. — K. Fortifikationsförv., Befästningsbyrån, Rapport 109: 12, 141 pp., 81 text-figs. Stockholm 1956.

Bruneau, Leif: Bräckvatten som recipient för cellulosaavloppsvatten [Brackish water as recipient for cellulose industry waste water]. — Sv. Papperstidn., 59, pp. 465—476, 14 text-figs. English and German summaries p. 465. Stockholm 1956.

Bruzelius, Nils G.: Komprimering och metoder för kontroll härav [Compression at road work and methods to control it]. — Sv. Vägfören. Tidskr., 44, pp. 223—226, 3 text-figs. Disc. Södergren, Bruzelius, ibid., pp. 236—237, Norrtälje 1957.

Summary of a lecture given at a meeting in Jämtland arranged by the Swedish Road Society in 1957. *WL.*

Brynielsson, Harry: Svensk atomenergiverksamhet. AB Atomenergi [Swedish atomic energy work. The Swedish Atomic Energy Co.]. — Sverige inför atomåldern. 14 svenska experter om ett aktuellt ämne, pp. 202—215, 7 text-figs. Bonniers. Stockholm 1956.

Among other things the methods for production of uranium from the oil shales at Kvarntorp in Middle Sweden are briefly described. *WL.*

Brynielsson, Harry: Sweden's energy outlook. — United Nations. Proc. of the Int. Conf. on the Peaceful Uses of Atomic Energy held in Geneva 8 August —20 August 1955, 1, pp. 229—232, 1 text-fig. New York 1956.

Brännfors, Sten: Tunnlar och bergrum [Tunnels and rock chambers]. — Byggmästaren, B, 36, pp. 79—84, 12 text-figs. English summary in the announcements section p. 21. Stockholm 1957.

Byström, Eric: Jordstabilisering — någonting för Skå-Edeby? [Soil stabilization — anything for Skå-Edeby?] — Väg- och vattenbyggaren, 3, pp. 60—61, 4 text-figs. Stockholm 1957.

The method of stabilization of weak soils by application of a stabilizer, *e. g.* cement or lime, is described. *WL.*

Carlsson, Carl Eb.: Grythyttans skifferverk [The slate works of Grythyttan]. — Grythyttan i ord och bild, 1, pp. 34—36, 2 text-figs. Filipstad 1956.

A reprint of a paper in the periodical publication Norden, printed in 1904. *WL.*

Clare, K. E.: Jordstabilisering med cement [Soil stabilization by cement]. — Väg- och vattenbyggaren, 2, pp. 7—12, 9 text-figs. Stockholm 1956.

An account of experiences as to cement stabilization of soils made in Great Britain. *WL.*

Cornwell, Fred E.: Verkan av markskakningar vid sprängning invid byggnader och anläggningar [The effects of blasting on nearby structures]. — Handb. i Bergsprängningsteknik, 1, pp. 8: 02-1 — 8: 02-24, 6 text-figs. In English, French, German, and Swedish. Stockholm 1957.

Dahlin, Curt: Development and testing of cemented tungsten carbide tipped drill steels. Part I: Development of integral drill steel. — Bull. Univ. of Missouri, School of Mines and Metallurgy, Techn. Ser., 94, pp. 67—82, 14 text-figs. Rolla, Missouri 1957.

Dahlin, Curt: Development and testing of cemented tungsten carbide tipped drill steels. Part II: Testing. — Bull. Univ. of Missouri, School of Mines and Metallurgy, Techn. Ser., 94, pp. 83—92, 4 text-figs. Rolla, Missouri 1957.

Dahlström, S. B. & Persson, Olof: Two jumbos speed bench drilling in Swedish tunnelling. — EMJ, 157: 7, pp. 104—106, 6 text-figs. New York 1956.

Dietert, Harry W., Graham, Alex & Dietert, Randolph: Automatic tempering of molding sand. — 24th Int. Foundry Congr. Stockholm, 19—24 VIII 1957, 2, pp. 429—444, 8 text-figs., 1 portrait. French summary pp. 430—431. German summary pp. 431—432. Stockholm 1957. Disc. Schnautz, H. W. Dietert, ibid., 3, pp. 788—789. Stockholm 1958.

Du Rietz, Carl: Fatty acids in flotation. — CMJ, 78: 11, p. 103. Ottawa 1957.

Ekelund, Hans: Grundvattensänkning [Lowering of the ground-water table]. — Sv. Komm.-Tekn. Fören. Handl. 1956: 15, 7 pp., 5 text-figs. Stockholm 1957.

Lowering of the ground-water level in town areas, its causes and consequences as well as counteractive measures are dealt with. *WL.*

Ekman, Wilhelm: Trollhätte kanal och katastrofen vid Göta Sulfitfabrik [The Trollhätte canal and the catastrophe at the sulphite mill of Göta]. — TT, 87, p. 920. Norrköping 1957.

Discusses the importance of the load of buildings etc. as a cause of the landslides at Surte and Göta and emphasizes that the problem of the causes of the slides in the valley of the river Göta älv may be rather complex. *WL.*

Elfman, Sten: Lasele kraftstation [The hydroelectric power-plant at Lasele]. — TT, 87, pp. 941—951, 1 portrait, 17 text-figs. Norrköping 1957.

The fall of the river Ångermanälven is 53 metres at Lasele. The yearly power production is 610 Mkwh. The constructions of dam, tunnels, canal etc. are described and the geology and hydrology of the place are briefly mentioned. *HT.*

Elmberger, Per: Oljan — en viktig faktor i vår energiförsörjning [Oil — an important factor of our energy supply]. — IVA, 27, pp. 340—358, 16 text-figs. Stockholm 1956. Also in IVA:s Bränsletekn. Medd. No. 25, pp. 5—23. Stockholm 1957.

Oil production and petroleum reserves of the world are discussed. The consumption in different parts of the globe is also mentioned. In Sweden the consumption of oil in the year 1955 was 1 306 l *per capita*, *i. e.* 9.6 million m^3. *HT.*

Erwall, L.-G.: Radioaktiva isotopers användning inom vatten- och avloppstekniken [Use of radioisotopes for water supply and sanitary technics]. — Vattenhygien, 12, pp. 2—11, 8 text-figs. Stockholm 1956.

A summary of methods used for water flow and velocity measurements in the ground and in sanitary engineering research. *HT.*

Esping, Lars-Erik: Exploitation of gravel in Sweden — Restoration work and replacing material. — Int. Union for the Conserv. of Nature and Nat. Res. Sixth Techn. Meeting. Edinburgh June 1956. Proc. and Papers, p. 147. London 1957.

Fellenius, Bror: Geotekniska bestämmelser, en sak på gott och ont [Geotechnical rules, a matter of good and evil]. — Tekn. Fören. i Finland Förhandl., 76, pp. 124—129, 2 text-figs. English summary p. I. Helsingfors 1956.

Flodkvist, Herman: Några råd till jordbrukare, som ämna utföra åkerdränering (täckdikning) [Some advice for farmers who intend to carry out field drainage (subsoil drainage)]. — Grundförbättring, 10, pp. 180—182. English summary p. 200. Uppsala 1957.

Flodkvist, Herman: Om isbildning på höstsädesfält och vallar. Bilder med text [On formation of ice on autumn-sown fields and on pasture ground. Pictures with text]. — Grundförbättring, 10, pp. 240—241, 2 text-figs. Uppsala 1957.

Author emphasizes the importance for the crop yields of drawing off from frozen soils the surface water formed by melting of snow during thawing periods in winter. *WL.*

Foghammar, Sverker: Vattnet på sommarnöjet [The water at the summer house]. — VoV, 6, pp. 171—173, 4 text-figs. Göteborg 1956.

Gives *inter alia* physico-chemical and bacteriological data on the well-water of a farm on the Onsala peninsula. *WL.*

Fransén, H., Ljungdahl, K.-G., Olhammar, Gösta, Petrén, Folke, Qvistgaard, J. H., Werner, Donovan & Hallberg, Sven: Bränsleförsörjningen i atomåldern. Betänkande avgivet av bränsleutredningen 1951. Del I. Förutsättningar, slutledningar, rekommendationer och förslag [Fuel supply in the atomic age. Report delivered by the fuel commission of 1951. Part I. Conditions, conclusions, recommendations, and proposals]. — Statens Offentliga Utredningar 1956: 46. Handelsdepartementet, 94 pp., 3 text-figs. Stockholm 1956.

Mainly political discussion of the general situation in Sweden concerning fuel and fuel supply. *HT.*

Fransén, H., Ljungdahl, K.-G., Olhammar, Gösta, Petrén, Folke, Qvistgaard, J. H., Werner, Donovan & Hallberg, Sven: Bränsleförsörjningen i atomåldern. Betänkande avgivet av bränsleutredningen 1951. Del II. Grundläggande studier av energiförsörjningens förutsättningar inom viktigar områden [Fuel supply in the atomic age. Report delivered by the fuel commission of 1951. Part II. Basal studies of the conditions of energy supply in branche of importance]. — Statens Offentliga Utredningar 1956: 58. Handelsdepartementet, 214 pp., 35 text-figs, 4 plates. Stockholm 1956.

The energy supply by peat, oil shale, nuclear fuel, hydroelectric power, and win is discussed. The requirements of industry are also mentioned. *HT.*

Funke, Gösta W.: Atomic energy work in Sweden. — Research Wor published in Sweden, 33, pp. 1—6. Uppsala 1957.

Garland, Sven-Olof: Det svarta guldet. Ett program om olja [The blac gold. A programme on oil]. — Skolradio, 178, pp. 33—35, 13 text-figs. Stockholm 1956 (1957).

A popular summary of a radio programme on oil, its geological occurrence, exploiting, and economic importance. *WL.*

Glömme, J. & Swensson, Åke: Om andra pneumokonioser än silikos [O other pneumoconioses than silicosis]. — Nord. Med., 58, p. 1973. Hälsingbor 1957.

Graphite lung, kaolinosis, aluminosis a. o. pneumoconioses are briefly dealt with. *WL*

GRAFSTRÖM, ERIK, OHLON, SVEN EM., SKÖLD, PER EDVIN, ALER, BO, HÅKANSSON, HANS & WIEDESHEIM-PAUL, GÖSTA: Atomenergien. Betänkande med förslag avgivet av 1955 års atomenergiutredning [The atomic energy. Report with proposals delivered by the Atomic energy commission of 1955]. — Statens Offentliga Utredningar 1956: 11. Handelsdepartementet, 117 pp. Stockholm 1956.

Contains *i. a.* chapters on world supply of atomic fuel as well as on uranium supply and uranium production in Sweden. *WL.*

GRIP, E.: Så letar vi malm [Thus we are searching for ore]. — Smältdegeln, 1956: 3, pp. 4—5, 2 text-figs. Skellefteå 1956.

Different methods for ore prospecting used by the Boliden Mining Co. are briefly described. *WL.*

GULLIN, H.: Skiffer [Slate]. — Kroppefjäll. En Dalslandsbok. Socknarna Dalskog—Gunnarsnäs—Ör, pp. 584—588. Vänersborg 1957.

History of the quarrying of the slate of the Dal formation at Halängen, Källsviken, and Hällan in the parishes of Dalskog and Gunnarsnäs, Dalsland. *WL.*

GUSTAFSSON, BENGT: Grundvattenförhållandena vid Vivstavarv under dämningen vid Bergeforsen [The ground water conditions at Vivstavarv during the damming at Bergeforsen]. — TT, 86, pp. 289—292, 6 text-figs. Norrköping 1956.

When damming the river Indalsälven at the hydroelectric powerstation of Bergeforsen a glacifluvial esker crossing the river above the dam was filled with water to about 20 metres above the natural level. At Vivstavarv, 2 500 metres farther south, springs began to flow at several places. A pit was dug to drain off the ground water and 0.6 m^3/sec. flowed away to the sea — one of the best springs known in Sweden. *HT.*

GUSTAFSSON, BENGT: Vad händer med grundvattnet? [What happens to the ground water?] — TT, 87, pp. 773—779, 1 portrait, 7 text-figs. Norrköping 1957.

After mentioning the general ground water equation the author illustrates by some examples the rainfall as well as evaporation and transpiration losses in Sweden. The nfluence of climatic fluctuations on precipitation and that of forestry and agriculture on ground water increment and run-off are also discussed. Some hydrogeological problems in Holland, Great Britain, and Sweden are mentioned and examples on water pollution are given. *HT.*

GUSTAFSSON, YNGVE: Vattenbalansproblem i jordbruk och skogsbruk [Problems of water balance in agriculture and forestry]. — Jord-Gröda-Djur, 14, pp. 31—36, 3 text-figs., 1 portrait. Stockholm 1957 (1958).

The problem of the water supply is discussed from different points of view and the mportance of climatic factors as well as of sylvi- and agricultural measures, such as draining, is emphasized. *WL.*

HAGERMAN, TOR: Berggrundens sprickor och vattenföring [Fractures and water-supply of the bedrock]. — Väg- och vattenbyggaren, 2, pp. 15—16, 3 ext-figs. Stockholm 1956.

Different kinds of fractures in the Archean, water-supply, ground water, drainage nd tightening of rocks by injection are discussed. *WL.*

Hagerman, Tor: Byggen, berggrund och grundvatten [Constructions, bedrock, and ground water]. — TT, 86, pp. 799—804, 12 text-figs. Norrköping 1956. Also as Hagermans Konsultationsbyrå, Stockholm, Medd. 12, 20 pp. English summary pp. 18—20.

At the construction of tunnels, underground rooms or shafts for deep foundation the ground water of the rocks — in this case granite and gneiss — will cause practica consequences for the work or construction. The geometrical occurrence of joints an fractures and their classification are mentioned. The water is conducted through fault down to wide joints acting as reservoirs. Some dry, although fractured sections ar encountered at great depths below the theoretical ground water level. To protec buildings against infiltrating water the author recommends pre-injections with cemen mixtures made by means of long drilled holes. *HT.*

Hagerman, Tor: Saltvandring i bergarter [Salt movement in rocks]. — TT, 86, pp. 293—295, 4 text-figs. Norrköping 1956. Also as Hagermans Konsultationsbyrå, Stockholm, Medd. 11, 11 pp. English summary pp. 10—11.

The investigation was performed by means of pieces of cylindrical rock sample fixed with sealing wax to one end of glass tubes. Next to the rock sample the tub was filled with quartz sand, the pores of which were occupied by a salt solution. Th granites are subject to permeation and destruction particularly by sodium chloride whereas limestone and sandstone are also destroyed by magnesium sulphate. *HT.*

Hagerman, Tor H. & Sund, Buster: Oljelagringsanläggningar i berg Geologiska förundersökningar [Oil storage installations in rock. Geologica pre-investigations]. — Hagermans Konsultationsbyrå, Stockholm, Medd. 15 6 pp. English summary p. 6. Stockholm 1957.

Hansson, Lennart: Marmorbrott 110 m under marken [A marble quarry 110 metres below the surface]. — Stenarbetaren, 1956: 1, pp. 8—11, 7 text-figs. Uddevalla 1956.

Quarrying and working marble at the New Marble Factory Limited, Kolmården Brief history. *HT.*

Hallgren, Gunnar: Grundvattenuppdämning medelst öppna och täckt ledningar [Rise of ground water by means of open and covered conduits]. — BVM, 8, pp. 21—23, 1 text-fig. Uppsala 1956.

Some experiences from Ultuna are given concerning the changes of the ground-wate level at different distances from a draining canal at admission of water and at pumpin respectively. *WL.*

Hallgren, Gunnar: Om anläggning av vattentäkter [On digging of wells] — Grundförbättring, 9, pp. 179—184, 2 text-figs. English summary p. 25 Uppsala 1956.

Hallgren, Gunnar & Östholm, Carl-Olof: Om utfällning av järn i dräneringsledningar [On iron precipitation in drain pipes]. — Grundförbättring 10, pp. 87—101, 2 text-figs. English summary p. 154. Uppsala 1957.

Hast, Nils: Bergtrycksmätningar i gruvor [Measurements of rock pressur in mines]. — JKA, 141, pp. 633—745, 51 text-figs. English summary p 744—745. Disc. Janelid, Obert, ibid., pp. 749—752. Uppsala 1957.

HEDBÄCK, TORE J.: Gasframställning med skiffer som råvara [Production of gas with shale as raw material]. — IVA:s Bränsletekn. Medd. No. 25, pp. 79—84, 3 text-figs. Stockholm 1957.

The paper for the main part deals with methods used at the oil plant at Kvarntorp. The raw material is alum shale and some figures are given on the oil supply. *HT.*

HEDLUND, JOHN: Gruvforskningen år 1955 [The mining research in 1955]. — Medd. fr. Sv. Gruvfören., 77, 15 pp. Uppsala 1956.

Contains *inter alia* a brief account of the results of technical research executed by Jernkontoret in collaboration with Svenska Gruvföreningen. *WL.*

HEDSTRÖM, E. H.: In defense of mining geophysics. — Geophys. Prospecting, 5, pp. 231—238. Leiden 1957.

HELMFRID, STAFFAN: Aktuellt om olja [News about oil]. — Ymer, 77, pp. 54—57. Stockholm 1957.

An item of information on the oil consumption of the world in the year 1955. *HT.*

HILTSCHER, R.: Scheitel- und Wandspannungen an Tunnelöffnungen mit rechteckigem Nutzquerschnitt und kreisbogenförmiger Überwölbung [Roof and wall stress at tunnel openings of rectangular basic profile and circular roof]. — Festskr. till Prof. Carl Forssell, pp. 44—52, 8 text-figs. Stockholm 1956. Also in Inst. f. Byggnadsstatik, KTH, Medd., 25.

HILTSCHER, RUDOLF: Spannungen an Tunnelöffnungen mit rechteckigem Nutzquerschnitt und kreisbogenförmiger Überwölbung [Stress distribution around tunnel openings of rectangular basic profile with circular roof]. — Der Bauingenieur, 32, pp. 288—291, 8 text-figs. Berlin 1957. Also as Inst. f. Byggnadsstatik, KTH, Medd., 26, 12 pp. English summary pp. 11—12.

HUBENDICK, P. E.: Bergrumsanläggningar för sandlagring [Underground reservoirs for storage of sand]. — Sv. Vägfören. Tidskr., 43, pp. 268—272, 6 text-figs. Norrtälje 1956.

Describes different ways of constructing rock silos for sand in dependence of form, height, and quality of the rock. *WL.*

HÖRMANDER, O.: Svensk uranindustris utbyggnad [The growth of the Swedish uranium industry]. — TT, 87, p. 366. Norrköping 1957.

Brief notice on the plans for an increased Swedish uranium industry founded on the exploitation of the upper part rich in uranium of the Cambrian shales overlying the oil shale at Kvarntorp and in Billingen. *WL.*

INGBERK, KJELL, SCHÜTZ, FREDRIK & VRETBLAD, ERIK: Markstabilisering genom injektering [Soil stabilization by injection]. — Statens Nämnd för byggnadsforskn., Handl., 30, 103 pp., 67 text-figs. English summary pp. 99—100. Norrköping 1957.

JANELID, I.: Bergborrningsmetoder och deras användningsområden [Rock drilling methods and their fields of use]. — Handb. i Bergsprängningsteknik, 1, pp. 8: 30-1 — 8: 30-44, 19 text-figs. In English, French, German, and Swedish. Stockholm 1957.

Janelid, Ingvar: Drilling and blasting equipment and methods in Swedish mines. — CMJ, 77: 12, pp. 71—76; 78: 1, pp. 60—65, 27 text-figs. Ottawa 1956—57.

Janson, Lars: Jordstabilisering med cement [Soil stabilization with cement]. — Cement och Betong, 31, pp. 200—209, 9 text-figs. Halmstad 1956.

Applicability and working methods by soil stabilization with cement are illustrated by Swedish experiments. *WL.*

Jensen, Kr. M.: Det dyrbara vattnet i jorden. Om vanliga och ovanliga grundvattensförhållanden [The valuable water in the soil. On common and uncommon ground-water conditions]. — VoV, 6, pp. 321—329, 9 text-figs. Göteborg 1956.

Gives in a popular form an account of the mode of occurrence of ground water in different parts of the earth. *WL.*

Johansson, Erik (E. J.): Utredning om silikos [An investigation of silicosis]. — Stenarbetaren, 1956: 5, pp. 8—9, 4 text-figs. Uddevalla 1956.

A commentary by workers on an investigation of prophylactic measures. *HT.*

Johansson, Erik: Världens största skifferbrott [The greatest slate-quarry of the world]. — Stenarbetaren, 1956: 4, pp. 8—10, 7 text-figs. Uddevalla 1956.

At the Penrhyn quarry in Wales slate has been quarried since the eleventh century. The total area of the quarry is over 200 hectares, that of quarrying in progress 40 hectares. Work is going on in about 20 galleries, 22 km in length. The greatest depth is 350 m. The slate is used for roofing in 3—4 mm thick slabs but also for construction of houses and monuments. *HT.*

Johansson, Halvar: Översikt över det nuvarande läget och utvecklingstendenserna inom vattenvårdens grund- och hjälpvetenskaper samt inom vattenförsörjnings- och avloppstekniken. Forsknings- och utredningsuppgifter av mera allmänt intresse [General survey of present state and trends of development in the fundamental and auxiliary sciences of the water conservation as well as in the technics of water supply and sewage. Research work and investigation themes of more general interest]. — Ingeniörsvetenskapsakademien, FKO-medd. 27, appendix, pp. 1—118, 6 text-figs. Stockholm 1957.

Inter alia a brief account is given of those parts of the hydrogeology and hydrology which are of importance for the water conservation. *WL.*

Jondal, Bo & Brännfors, Sten: Bergsprängningsteknikens utveckling och aktuella problem [The development and actual problems of rock-blasting technique]. — Byggmästaren, B, 36, pp. 73—78, 12 text-figs. English summary in the announcements section p. 21. Stockholm 1957.

Jörbeck, A.: Nyare metoder för längdmätning [Modern methods for measuring lengths]. — Sv. Komm.-Tekn. Fören. Handl. 1955: 12, 13 pp., 13 text-figs. Stockholm 1956.

Construction and use of the electrooptical instruments for measuring lengths, the geodimeter and the terrameter, are described. *WL.*

JÖRGENSEN, JÖRGEN & SYLVAN, CARL: Schaktdrivning med långhålsborrning. Erfarenheter från Harrsele kraftverksbygge [Driving of raises by long blasthole drilling. Experiences from the construction of the Harrsele water power station]. — JKA, 140, pp. 306—313, 4 text-figs. English summary p. 313. Uppsala 1956.

JÖRGENSEN, JÖRGEN & SYLVAN, CARL: Schaktdrivning med långhålsborrning vid Harrsele kraftverksbygge [Driving of raises by long blasthole drilling at the Harrsele water power station]. — TT, 86, pp. 405—407, 3 text-figs. Norrköping 1956.

A shaft from a tunnel to the surface is usually made as a raise from below. The method described is applicable when the depth to the tunnel does not exceed 100 feet. Long holes are drilled and charged from the surface, and are blasted in a fixed system. *HT.*

KALLSTENIUS, TORSTEN & BERGAU, WERNER: Investigations of soil pressure measuring by means of cells. — Royal Swedish Geotechn. Inst. Proc., No. 12, 50 pp., 29 text-figs. Stockholm 1956.

KALLSTENIUS, TORSTEN & WALLGREN, ALF: Pore water pressure measurement in field investigations. — Royal Swedish Geotechn. Inst. Proc., No. 13, 58 pp., 35 text-figs. Stockholm 1956.

KING, ROBERT E.: Petroleum developments in Europe in 1955. Sweden. — Bull. Amer. Assoc. Petrol. Geol., 40, p. 1577. Menasha 1956.

LANGEFORS, U.: New raising methods. 1—3. — Mine and Quarry Engineering, 23, pp. 338—343, 391—398, 444—448, 26 text-figs. London 1957.

LANGEFORS, U.: Nya metoder för stigortsdrivning [New methods for driving of raises]. — JKA, 140, pp. 265—305, 26 text-figs. English summary pp. 304—305. Uppsala 1956.

LANGEFORS, U., WESTERBERG, H. & KIHLSTRÖM, B.: Skadeverkan av markskakningar vid sprängning [Damage by ground vibrations at blasting]. — JKA, 141, pp. 261—299, 24 text-figs. English summary p. 298. Uppsala 1957.

LAUSKIS, A.: Några statistiska uppgifter rörande brunnar i Norrland jämte kommentarer [Some statistical data concerning wells in Norrland with comments]. — Grundförbättring, 10, pp. 102—123, 11 text-figs. English summary p. 154. Uppsala 1957.

LEVANDER, LARS: Slipstenstillverkning [Grindstone production]. — Orsa. En sockenbeskrivning, 3, pp. 375—398, 9 text-figs. Stockholm 1957.

A map of the grindstone quarries at Kallmora in the parish of Orsa, Dalarna, is given together with a description of the methods of quarrying. *WL.*

LINDQVIST, KARL-HENRIK: Resultat av fördjupning av grundvattentäkt [Results of deepening of well]. — Hygien. Revy, 46, pp. 353—354. Uppsala 1957.

The deepening of a well in an esker with 2 m resulted in a deterioration of the quality of the water. *WL.*

Liukko, Toivo: Förekomsten av översvämningsområden som utjämnande faktor [The occurrence of submerged areas as a compensating factor]. — NJF, 39, pp. 165—172, 5 text-figs. Disc. Kaitera, Liukko, ibid., pp. 176—177. Uppsala 1957.

Methods of calculation of the increase of the maximum high water run off of a watercourse which is necessary for an effective drainage of flood basins, and improvements of the methods worked out in Finland are briefly dealt with. *WL.*

Ljunggren, Margit: Keramik. Grundläggande lärobok [Ceramics. Elementary text-book]. — Ehlins, Yrkesserien, 110 pp., 86 text-figs. Stockholm (1957).

Deals with the clays and their preparation as well as the different ceramic working methods. *WL.*

Lundberg, Hans: Airborne gravity surveys. — Canadian Min. and Met. Bull., 50, pp. 465—473, 18 text-figs. Montreal 1957.

Lundberg, Hans: Airborne gravity surveys. — CMJ, 78: 6, p. 121. Ottawa 1957.

Lundberg, Hans: Can airborne radiation surveys supplement geochemical exploration? — XX Congr. Geol. Int. Resumenes de los trabajos presentados, p. 368. México 1956.

Lundberg, H. (U. Fleischer): Die neuesten Entwicklungen der »airborne»-Geophysik [Recent progress of airborne geophysics]. — Erdöl und Kohle, 9, p. 867. Hamburg 1956.

Lundberg, H.: The latest developments in air-borne geophysics. — Geophys. Prospecting, 4, p. 310. Leiden 1956.

Lundström, Rune: Grundförhållanden och sättningskalkyler för storflygplats vid Skå-Edeby [Soil conditions and settlement analyses for intercontinental airport at Skå-Edeby]. — Väg- och vattenbyggaren, 3, pp. 55—59, 11 text-figs. Stockholm 1957.

Results of clay investigations in the area with special regard to primary and secondary settlements at loading are given. *WL.*

Lyshede, J. M.: Vandløbsregulering og afstrømningsmaksima [Regulations of watercourses and run off maxima]. — NJF, 39, pp. 173—176, 5 text-figs. Uppsala 1957.

The influence of a regulation on the run off conditions of a watercourse is theoretically dealt with using the change of the volume of the water basins and illustrated by examples from Denmark. *WL.*

Magnusson, N. H.: Geologisk belysning av svaghetsfenomen i berggrunden i mellansvenska gruvor [Geological explanation of the weakness phenomena in the bedrock of the mines in Central Sweden]. — JKA, 141, pp. 601—632, English summary pp. 631—632. Disc. Lindroth, Janelid, Obert, ibid., pp. 745—752, 5 text-figs. Uppsala 1957.

MALM, GÖSTA: Trollhätte kanal och katastrofen vid Göta Sulfitfabrik [The Trollhätte canal and the catastrophe at the sulphite mill of Göta]. — TT, 87, pp. 673—674, 920. Norrköping 1957.

Deals with the Trollhätte canal and the possibilities of eliminating the slide risks in the valley of the river Göta älv. *WL.*

MALMQVIST, DAVID: Eine elektromagnetische Methode zur Bestimmung der elektrischen Leitfähigkeit und magnetischen Permeabilität von Bohrkernen [An electromagnetic method for determining electric conductivity and magnetic permeability of cores]. — Freib. Forsch.-H., C 32, pp. 20—39, 7 text-figs., 2 plates. Berlin 1957. Also as Bolidens Gruvaktiebolags verksamhet. Vet. och tekn. skr., 51.

MALMQVIST, DAVID: Leta malm med instrument [Prospecting by means of instruments]. — Smältdegeln, 1957: 1, pp. 10—13, 7 text-figs. Skellefteå 1957.

Describes in popular terms the recent development of Swedish geophysical prospecting methods with special regard to the activity of the Boliden Mining Co. in the Skellefte field. *WL.*

MALMQVIST, D.: The geophysical case history of the Kankberg ore deposits in the Skellefte District, North Sweden. — Geophys. Prospecting, 5, p. 356. Leiden 1957.

MATTSSON, STURE: Våra fossila bränslen. 2. Skiffern [Our fossil fuels. 2. The shale]. — Industria, 53: 7—8, pp. 42—47, 80, 6 text-figs. Stockholm 1957.

Deals with the use of oil shale as a fuel considering particularly the conditions at Kvarntorp, Nerike. *WL.*

MERENMIES, MARTTI: Vanadinverket i Otanmäki [The vanadium plant at Otanmäki]. — TT, 87, pp. 723—724, 2 text-figs. Norrköping 1957.

Of geological interest is the fact that the slig of the magnetite-ilmenite ore at Otanmäki in Finland contains 0.57 % V and 68 % Fe. *HT.*

MORFELDT, CARL-OLOF: Berg som undergrund. Några erfarenheter vid djupbyggandet i Stockholms centrum [Rock foundations. Some experiences from the constructing of deep-buildings in Central Stockholm]. — Byggmästaren, B, 36, pp. 90—92, 6 text-figs. English summary in the announcements section pp. 21—22. Stockholm 1957. Also as Hagermans Konsultationsbyrå, Stockholm, Medd. 14, 8 pp. English summary on cover p. 2.

NIELD, F. W. & EPSTEIN, DAVID: Application of sodium silicates for bonding sands. — 24th Int. Foundry Congr. Stockholm, 19—24 VIII 1957, 2, pp. 445—465, 20 text-figs., 2 portraits. French and German summaries p. 446. Stockholm 1957. Disc. Sabel, Epstein, Atterton, ibid., 3, pp. 790—798, 3 text-figs. Stockholm 1958.

NILSSON, TORE: Återställandet av Trollhätte kanal efter skredet vid Göta [The restoration of the Trollhätte canal after the landslide at Göta]. — TT, 87, pp. 1001—1005, 1 portrait, 2 text-figs. Norrköpng 1957.

A summary is given of the event, the hydrological conditions, and the work with the new passage at Göta. *HT.*

Norberg-Belder, Ewa: Hälleberget levde upp i Elath [The bedrock at Elath was brought to life]. — Stenarbetaren, 1957: 4, pp. 2—4, 4 text-figs. Uddevalla 1957.

How a new granite industry came into existence in Israel with the assistance of Swedish quarriers. *HT.*

Nordman, Rolf: Fluorhalten i dricksvattnet och förekomsten av tandröta hos folkskolans förstaklassister [The fluoride content in drinking water and the incidence of caries among first grade school children (in Finland)]. — Nord. Hygien. Tidskr., 38, pp. 221—224. English summary p. 224. Stockholm 1957.

Nordmark, Gunnar: Om inhalationsbehandling av silikossjuka [On inhalation treatment of silicosis patients]. — Sv. Läkartidn., 53, pp. 1658—1659. Stockholm 1956.

The inhalation treatment of the silicosis during about 2 1/2 years has not led to any change of the objective symptoms. *WL.*

Norin, Rolf: Lera och keramik. Några dagsaktuella problem [Clay and ceramic. Some current problems]. — GFF, 79, p. 772. English abstract p. 772. Stockholm 1957. Also in Reports from the Swedish Society for Clay Research, 8.

Norling, G. & Vanderberg, E.: Diamantborrning [Diamond drilling]. — Handb. i Bergsprängningsteknik, 1, pp. 8: 32-1 — 8: 32-38, 12 text-figs. In English, French, German, and Swedish. Stockholm 1956.

Odenstad, Sten: Markbärighet och tryckbankar vid kohesionsjord [Carrying capacity and pressure banks at cohesive soils]. — TT, 86, pp. 1033—1035, 4 text-figs. Norrköping 1956.

A new method of making pressure banks on a horizontal earth surface. Formulae and diagrams are given for the calculation of the size of the bank and the site of the most unsafe shearing surface in clay terrain with a downwards rectilinearly increasing shearing resistance. *HT.*

Palmstierna, Gunilla: Handbok i keramik [Handbook on ceramics]. — Fritzes Handböcker för Hem och Skola, 8, 92 pp., 46 text-figs. Katrineholm 1956.

Deals with the clays and the different ceramic working moments. *WL.*

Patterson, W. & Boenisch, D.: Einfluss des Bindetones auf die Grüneigenschaften von Giessereiformsand [Influence of the clay binder on green properties of foundry sands]. — 24th Int. Foundry Congr. Stockholm, 19—24 VIII 1957, 2, pp. 401—427, 16 text-figs., 2 portraits. English summary p. 402. French summary pp. 402—403. Stockholm 1957. Disc. Götz, Patterson, Boenisch, Parkes, Pettersson, ibid., 3, pp. 779—787. Stockholm 1958.

Petržela, Leo: Beitrag zur Theorie der chemisch gehärteten Formsande (CO_2-Verfahren) [Contribution to the theory of chemically hardened foundry sands (CO_2 process)]. — 24th Int. Foundry Congr. Stockholm, 19—24 VIII 1957, 2, pp. 467—495, 16 text-figs., 1 portrait. English summary pp. 468—469. French summary pp. 469—470. Stockholm 1957. Disc. Platt, Petržela, Schumacher, ibid., 3, pp. 799—806, 6 text-figs. Stockholm 1958.

PFLEIDER, EUGENE P.: A report on underground mining in Sweden. — Mining Engineering, 8, p. 161. New York 1956.

REINIUS, ERLING: Modellundersökning av erosion i ett broläge [Investigation of erosion at a bridge position with a hydraulic scale model]. — TT, 86, pp. 1025—1032, 16 text-figs. Norrköping 1956.

Description of a scale model experiment in hydraulic engineering executed for the purpose of selecting position of a bridge, calculating the spans, and examining how to reduce injurious stream erosion, transport, and resedimentation at the alternative chosen. *HT.*

RISTNER, GUNNO: Redogörelse för ny borrningsmetod vid håldjup upp till 8,4 m [Report on a new drilling method for bore hole depths up to 8.4 metres]. — JKA, 141, pp. 847—848, 2 text-figs. Uppsala 1957.

As flexible drill rods are used, the method is well adapted to mines and other places where space is limited. *WL.*

ROSÉN, BO: Den väldiga dammen [The huge dam]. — SN. Sv. Naturskyddsfören. Tidskr., 47, pp. 14—17, 4 text-figs. Uddevalla 1956.

The construction of the earth dam at the power station Trängslet in the river Österdalälven is briefly mentioned mainly from a preservation point of view. *HT.*

ROSÉN, BO: Så förstör man ett landskap [Thus people destroy a landscape]. — SN. Sv. Naturskyddsfören. Tidskr., 47, pp. 143—146, 2 text-figs. Uddevalla 1956.

An emotionally tinged report on the outcome of drainings in the water system of the river Kävlingeån in the province of Scania. *HT.*

ROTHELIUS, ERNST: Swedish mineral dressing mills. Short descriptions and flowsheets. — International Mineral Dressing Congress Stockholm 1957, 252 pp. Stockholm 1957.

SCHJÅNBERG, E. (I. J.): Petrokemisk industri i Västeuropa [Petrochemical industry in Western Europe]. — SKT, 69, p. 533. Stockholm 1957.

Brief review of a lecture on chemical industries founded on petroleum and natural gas given in October 1957 at a meeting with the Örnsköldsvik section of the Swedish Chemical Association. *WL.*

SCHRAGE, INGRID: Experimentelle Untersuchungen zur induzierten galvanischen Polarisation an Sulfiderzen und graphitführenden Gesteinen [Experimental investigations on the induced galvanic polarisation of sulphide ores and graphite-bearing rocks]. — Freib. Forsch.-H., C 28, pp. 15—67, 51 text-figs. Berlin 1956. Also as Mitt. aus dem Inst. f. theor. Phys. und Geophys. der Bergakad. Freiberg, 10.

Some of the ore and rock specimens investigated originate from Sweden. *WL.*

SCHÜTZ, FREDRIK: Några tekniska problem i samband med djupbyggandet i centrala delarna av Stockholm [Some technical problems connected with foundation building in the central parts of Stockholm]. — Byggmästaren, B, 35, pp. 125—127, 2 text-figs. English summary in the announcements section p. 45. Stockholm 1956.

Segerros, Arne: Industrilandskapet i Kvarntorp [The industrial landscape at Kvarntorp]. — Bygd och Natur. Tidskr. f. Hembygdsvård, 37, pp. 179—181, 3 text-figs. Malung 1956.

Quarrying of the shale at Kvarntorp, Nerike, and the poisonous smoke from the oil industry are altering the landscape and its vegetation. Some investigations as to the problem of conservation of nature in the region are mentioned. *HT.*

Segerros, Henning: Våra vatten [Our waters]. — Bygd och Natur. Tidskr. f. Hembygdsvård, 37, pp. 106—111, 2 text-figs. Malung 1956.

Hydroelectric power plants necessarily result in great encroachments on the features of valleys. Some points in dispute concerning the valleys of the Ume River, Lilla Lule River, and Lake Kultsjön are discussed. *HT.*

Segerros, Henning: Vägsektionen i skärning [The road section in cuttings]. — Sv. Vägfören. Tidskr., 43, pp. 404—409, 6 text-figs. Norrtälje 1956.

Some problems concerning road cuttings are dealt with such as appropriate dip of the slope in dependence of the properties of the soil, water conditions, exposition etc., drainage of slopes in cuttings, and different measures for the stabilization of slopes by vegetation. *WL.*

Selander, Sten: Vattnet i farozonen [Water in danger]. — IVA, 27, pp. 45—46. Stockholm 1956.

A brief survey of surface water pollution through waste waters from communities and factories. *HT.*

Sjögren, Bengt: Europa törstar efter vatten. Rik natur hotar förvandlas till halvöken [Europe is thirsting for water. Rich nature threatens to be transformed into semidesert]. — Skogsägaren, 33, pp. 40—42, 2 text-figs. Stockholm 1957.

Discusses the water problems on account of papers by A. Thienemann and P. Wolf. *WL.*

Svenke, Erik: Atomkraftfrågor vid Genèvekonferensen. Råvaruförsörjning och materialproblem [Questions on atomic power at the Geneva conference. Raw material supply and material problems]. — Sv. Vattenkraftfören. Publ., 457, pp. 11—15. Roslags Näsby 1955 (1956).

Deals with geology, prospecting, and raw material supply of uranium and thorium, extracting of uranium from ores, as well as refining, production of uranium metal, and questions of fuel elements. *WL.*

Svenke, Erik: On uranium milling. — EMJ, 158: 11, p. 82. New York 1957.

Svenke, Erik: Råvaror för framtida atomkraft [Raw material for future atomic power]. — Medd. fr. Sv. Gruvfören., 76, pp. 16—42, 17 text-figs. Disc. Waldenström, Lundberg, Svenke, Magnusson, Berglund, Føyn, Digman, Dalhammar, Eklund, Brynielsson, ibid., pp. 42—52. Uppsala 1956.

Deals *i. a.* with the occurrence of the uranium minerals, instruments, and prospecting technique, particularly with regard to conditions in Sweden. *WL.*

Svenke, Erik: Råvaruförsörjning och materialfrågor [Raw material supply and material questions]. — Sverige inför atomåldern. 14 svenska experter om ett aktuellt ämne, pp. 93—110, 4 text-figs. Bonniers. Stockholm 1956.

The uranium ores of the world and their content of pure uranium are briefly discussed. Other products of current interest are heavy water, beryl, graphite, and zircon. Adsorption capacity for neutrons and radiation damage are mentioned. *HT.*

Svenke, Erik: Some aspects of the uranium milling industry. — CMJ, 78: 11, p. 105. Ottawa 1957.

Svenke, Erik: Svensk atomkraft — råvaru- och bränslefrågor [Swedish atomic power — questions of raw materials and fuel]. — TT, 87, pp. 1—6, 4 text-figs. Norrköping 1957.

Of some geological interest are a brief account of the production of uranium from Swedish alum shales and the plans for increasing the production capacity. *WL.*

Svensson, Jonas & Murkes, Jacob: An empirical relationship between work input and particle size distribution before and after grinding. — CMJ, 78: 11, p. 100. Ottawa 1957.

Svensson, Jonas & Murkes, Jakob: An empirical relationship between work input and particle size distribution before and after grinding. — EMJ, 158: 11, pp. 80—81. New York 1957.

Tornqvist, Björn Hans: Über elektromagnetische Prospektion vom Flugzeug aus [On electromagnetic prospecting from the air]. — Freib. Forsch.-H., C 29, pp. 19—25, 4 text-figs. Berlin 1956. Also as Bolidens Gruvaktiebolags verksamhet. Vet. och tekn. skr., 49.

Tryselius, Olof: Sjöregleringars inverkan på vattenstånd och vattenföring [Influence of lake regulations on water level and discharge]. — NJF, 39, pp. 162—164, 1 text-fig. Uppsala 1957.

The method of reconstructing water level and discharge under natural conditions from corresponding data after regulation is briefly reviewed and exemplified by Lake Torrön in 1953. *WL.*

Tullström, Helge: Aktuella utvecklingslinjer inom hydrogeologien [Current trends in hydrogeology]. — GFF, 79, pp. 775—780. English abstract p. 775. Stockholm 1957.

Tynelius, Sven: Grustagens sår i landskapet kan läkas [The wounds of gravel pits in the landscape can be healed]. — SN. Sv. Naturskyddsfören. Tidskr., 47, pp. 83—85, 3 text-figs. Uddevalla 1956.

A report of an attempt made near the town of Eskilstuna to restore an esker of lacifluvial origin to its former surface by controlled tipping into gravel pits out of se. *HT.*

Tørnqvist, G.: Geophysical history of the iron-mine at Forsbo, Sweden. — Geophys. Prospecting, 5, p. 84. Leiden 1957.

Törnqvist, G.: Some practical results of airborne prospecting in Sweden. — Geophys. Prospecting, 5, p. 356. Leiden 1957.

von Ubisch, Hans: Vilket skydd ger bergrum vid reaktorkatastrofer? [To what extent do rooms in bedrock protect against catastrophes at nuclear reactors?] — TT, 87, pp. 893—898, 1 portrait. Norrköping 1957.

The problem of preventing gaseous fission products from leaking out if a power reactor explodes is discussed. If the (Archean) bedrock cover is 20 m it is theoretically found that joints must not exceed 0.018 mm on the assumption that the additional pressure in the bedrock room first will be about 1 atmosphere and the reduction to zero pressure will take half an hour. *HT.*

Ullerstam, Anders: Sanering av en oljeförorenad grundvattentäkt [Purification of a ground-water occurrence contaminated by oil]. — Kommunaltekn. Tidskr., 22, pp. 181—186, 3 text-figs. Stockholm 1956.

The pollution of a well of the water works of Djursholm at the Uppsala esker through abt. 300 l Diesel oil was removed by washing the esker with 20 000 l of a one per cent sovetan solution. *WL.*

Ullerstam, A.: The adverse influence of any type of organic matter on the quality of underground water and the ways and means of controlling such risks in Sweden. — Vattenhygien, 12, pp. 81—90. Stockholm 1956.

Velin, Irving & Hedström, Fred: Grundundersökningar vid bebyggelseplanering [Soil investigations at the planning of buildings]. — Plan, 11, pp. 54—55. Stockholm 1957.

The significance of soil investigations for the estimation of the suitability of ground for buildings and for drawing up calculations of costs is emphasized. *WL.*

Wallin, C.-E.: Från berg till bygge. En berättelse om ett kalkstensstyckes vandring från råvara till färdig cement [From rock to building. A story about the way of a piece of limestone from raw material to prepared cement]. — Gullkornet, publ. by AB Gullhögens Bruk, Skövde, 7: 1, pp. 13—20, 27 text-figs. Stockholm 1957.

Popular account of the quarrying of the Ordovician limestone of Mount Billinger and of the cement production of the Gullhögen Co. *GL.*

Wallqvist, Örjan: Våra fossila bränslen. 1. Torven [Our fossil fuels. 1. The peat]. — Industria, 53: 5, pp. 42—46, 7 text-figs. Stockholm 1957.

The applicability of peat as fuel now and in future is discussed. *WL.*

Wehtje, Ingvar: Automatiserad storindustri i sten [Automatized manufacturing industry in stone]. — Cement och Betong, 32, pp. 224—230, 8 text-figs. Halmstad 1957.

Account of the biggest and most modern macadam mill of Sweden in Hardeberga Scania. *WL.*

Welin, E.: Refraktionsseismische Untersuchungen für ein Wasserkraftwerk in Nordschweden [Seismic refraction investigations for a hydro-electric plant in North Sweden]. — Erdöl und Kohle, 10, p. 618. Hamburg 1957.

Welin, E.: Seismic refraction survey of a hydro-electric plant site in Northern Sweden. — Geophys. Prospecting, 5, p. 83. Leiden 1957.

Welin, E.: Seismic refraction survey of a hydroelectric plant site in northern Sweden. — Geophysics, 22, p. 749. Houston 1957.

Westlund, C.: Hot air pays off. Use of hot compressed air at Kiruna. — CMJ, 77: 1, pp. 51—52. Ottawa 1956.

Widell, Torsten & Gustafsson, Lars: Kornstorleken hos stoft enligt olika mätmetoder [The particle size of dust according to different methods of measurement]. — Fläkten, 21, pp. 32—50, 12 text-figs. Stockholm 1957.

The conception of grain size at different methods of measurement is discussed and results of comparative measurements are presented. *WL.*

Wigander, Olle (Ed).: Teknisk beskrivning av Stockholms tunnelbana [Technical description of the Underground of Stockholm]. — P. A. Norstedt & Söners Förlag, 149 pp., 207 text-figs., 1 plate. Stockholm 1957.

Contains *i. a.* a geological survey (p. 13) as well as accounts of special constructions and methods of working in rock and in soils (pp. 41—74). *WL.*

Winnacker, Karl: Über Rohstoffprobleme der organisch-chemischen Grossindustrie [On the problems of raw material of the organic-chemical manufacturing industry]. — IVA, 27, pp. 133—146, 9 text-figs. Stockholm 1956.

Wolff, Hans: Hårdmetall för bergborr [Hard metal for rock drills]. — Bergslaget, 11: 3, pp. 18—24, 11 text-figs. Stockholm 1956.

The manufacture of rock drills with bits of wolfram carbide is described. *WL.*

Wolff, Ph.: Utdikad civilisation [Drained civilization]. — Skr. utg. av Sv. Lax- och Laxöringsfören. Malmö, 7, 104 pp., 14 text-figs. Malmö 1956.

An account of the unfavourable effects in different respects of draining as illustrated by investigations from the precipitation area of the river Kävlingeån. *WL.*

Wredenfors, Walter: Bygge på tjälad jord [Construction on frozen soil]. — TT, 86, pp. 1021—1024, 3 text-figs. Norrköping 1956.

A summary of literature about uplift by frost in the ground and calculation of the mplitude of frost uplift. An experiment with house-building on frozen silt and fine and is described. *HT.*

Ytterborn, G. R., Netzén, G., Elofsson, Gust., Petersson, G., Bergström, Bele, Björklund, C. M. & Andersson, Sven: Markvård och erosionsskydd. Betänkande avgivet av 1949 års jorderosionskommitté [Soil conservation and protection against erosion. Report delivered by the Soil erosion commission of 949]. — Statens Offentliga Utredningar 1957: 17. Jordbruksdepartementet, 2 pp. Stockholm 1957.

The paper which is of interest *i. a.* for applied geology and hydrology discusses a ot of Swedish soil problems and problems concerning erosion by wind and water. *HT.*

Örbom, Björn: Svenska erfarenheter av cementstabilisering [Swedish experinces of cement stabilization]. — Väg- och vattenbyggaren, 2, pp. 12—14, text-figs. Stockholm 1956.

Results from the working-places of the Air Force Administration are reported. *WL.*

Geology of Pre-Quaternary Rocks

GEOLOGY AND PETROLOGY OF CRYSTALLINE ROCKS

VON ECKERMANN, HARRY: Alnö alkalina intrusion i belysning av gångarna Bergeforsens kraftstationstunnlar [The Alnö alkaline intrusion in the light of the dikes in the tunnels of the Bergeforsen hydro-electric station]. — Geologi, 9, p. 35. Helsinki 1957.

A very short summary of a lecture on a theme in 1958 presented in a paper entitle »The alkaline and carbonatitic dikes of the Alnö formation on the mainland north west of Alnö Island» (KVA, Handl., Ser. 4, Vol. 7: 2). *PHL.*

VON ECKERMANN, H.: Alnö-eruptivets ålder [Age of the Alnö eruptive complex]. — NGT, 36, p. 74. Bergen 1956.

A U-Th-Pb-determination of pyrochlore indicates the age of the Alnö sövite to b not older than Eocambrian but possibly younger. *WL.*

VON ECKERMANN, H.: Alnöintrusionens tektonik och genesis i belysning a gångarna inom Bergefors-Östrandsområdet [Tectonics and genesis of the Aln intrusion in the light of the dikes in the Bergefors-Östrand district]. — GFF 79, pp. 285—287. Stockholm 1957.

Summary of a lecture before the Geological Society of Stockholm on a them presented in the above-mentioned paper in KVA, Handl., Ser. 4, Vol. 7: 2. *PHL*

V. ECKERMANN, H. & WICKMAN, F. E.: A preliminary determination of th maximum age of the Alnö rocks. — GFF, 78, pp. 122—124. Stockholm 1956

FRIETSCH, RUDYARD: Studier över skarnbildningen i Grythyttefältet [Studie of the skarn formation in the Grythytte field]. — GFF, 79, pp. 133—160, text-figs. English abstract p. 133, summary pp. 158—159. Stockholm 1957 Also as Medd. fr. Stockholms Högsk. Min. Inst., 213.

GJELSVIK, TORE: Pitchblende mineralization in the Precambrian Plateau Finnmarksvidda, Northern Norway. — GFF, 79, pp. 572—580, 6 text-fig Stockholm 1957.

GÜNTHERT, A. W.: Bildungsfolge und Koexistenzbeziehungen der Haupt gemengteile des Maggia-Lappens, einer penninischen Gneisserie des NW Tessi Schweiz [Sequence of formation and co-existence relations of the chief const tuents of the Maggia-Lappen, a Pennidic gneiss series of NW Tessin, Switze land]. — GFF, 79, pp. 101—106, 1 text-fig. English abstract p. 101. Stock holm 1957.

HJELMQVIST, S.: On the occurrence of ignimbrite in the pre-Cambrian. — SGU, C 542 [= Årsb. 49 (1955), N:o 2], 12 pp., 6 plates. Stockholm 195 Also as Skr. fr. Min.- o. Pal.-Geol. Inst., Lund, 32.

KOARK, HANS J.: Gefügeregel und Gefügegenität in einem Quarz in Quarz- Tektonit [Fabric and degree of heterogeneity in a quartz-in-quartz-B-tectonite] — BGIU, 37, pp. 43—78, 26 text-figs. Uppsala 1956—1957.

LJUNGGREN, PONTUS: Banded gneisses from Gothenburg and their transformations. — GFF, 79, pp. 113—132, 7 text-figs. Stockholm 1957.

LJUNGGREN, PONTUS: Complete and incomplete granitizations. — GFF, 78, pp. 642—644. Stockholm 1956.

LUNDEGÅRDH, PER H.: Hamrångesynklinalens ytbergarter och deras metasomatiska omvandling [The supracrustal rocks of the Hamrånge syncline and their metasomatic alteration]. — GFF, 78, pp. 329—344, 7 text-figs. English summary pp. 342—344. Stockholm 1956.

LUNDEGÅRDH, PER H.: Petrology of the Uppsala region, Eastern Sweden. — SGU, C 544 [= Årsb. 49 (1955), N:o 4], 74 pp., 28 text-figs., 1 plate. Stockholm 1956.

LUNDEGÅRDH, PER H.: The titaniferous ore-bearing gabbro of Helsingland, Central Sweden. — SGU, C 549 [=Årsb. 50 (1956), N:o 5], 34 pp., 16 text-figs. Stockholm 1957.

REDAELLI, LEONARDO L.: A petrological investigation in Lake Norra Dellen by means of frog-man equipment. — SGU, C 548 [= Årsb. 50 (1956), N:o 4], 22 pp., 16 text-figs. Stockholm 1957.

SUNDIUS, N.: Alkaline rocks and carbonates of alkalies, calcium and magnesium. — KVA, Arkiv f. Min. o. Geol., 2, pp. 319—331, 7 text-figs. Uppsala 1957 (1958).

TUGARINOV, A. I.: Epochi mineralo-obrazovanija v dokembrii [Epochs of mineral formation in the pre-Cambrian]. — Izvestija Akademii Nauk SSSR, Serija Geologičeskaja, 1956: 9, pp. 3—26, 6 text-figs. Moskva 1956.

Inter alia a survey is given of the sequence of pre-Cambrian series of the Baltic shield (including Sweden) according to absolute age determinations. *WL.*

WINKLER, HELMUT G. F. & WEITZ, GERDA: Kristallisation des Basalts von Hardeberga, Schonen [Crystallization of the basalt of Hardeberga, Scania]. — GFF, 78, pp. 619—641, 5 text-figs. Stockholm 1956.

ÅHMAN, ERIK: De glasiga diabasgångarna i Djupviks kalkbrott, Björkviks socken, Södermanland [The glassy dolerite dikes in the limestone quarry of Djupvik, parish of Björkvik, Södermanland]. — SGU, C 546 [= Årsb. 50 (1956), N:o 2], 18 pp., 7 text-figs. English abstract p. 3. Stockholm 1957.

GEOLOGY AND PETROLOGY OF POST-ARCHEAN SERIES

ASKLUND, B.: Eokambrium, dess indelning och omfattning [Eocambrian, its subdivision and extent]. — NGT, 36, pp. 86—87. Bergen 1956.

To the discussion at a conference on Eocambrian the author gave a review of the different traditions of thought in Sweden and in Norway concerning the problem of the Cambrian-Algonkian boundary. The author had used the term »Eocambrian» only for the upper part of the Swedish strata and corresponding Norwegian strata, namely, the youngest pre-Cambrian (*sensu stricto*) quartzites and intercalated shales. The author had found Thorolf Vogt's disregard of the term »Eocambrian» in the older

Norwegian sense logical, since a disconformity, partially with conglomerates, had been discovered in Norway as well as in Sweden. However, the lithological character of the quartzite-shale formation was inconsistent with including it in the »Sparagmitian» (Vogt), and therefore the author had retained the name »Eocambrian» for the uppermost part of the Late pre-Cambrian sediments. After a comprehensive re-examination of the whole problem the author had reached the opinion that the Eocambrian-Sparagmitian boundary ought to be placed at the base of the tillite-layers in Sweden and Norway. Then he now finds it more convenient to designate the »Eocambrian» sediments, including the tillites, as »Varegian» (Varegium). This name will recall the profound discovery of Reusch of a pre-Cambrian glacial deposit on Varjag-Njargga, the Lappish name for the Varanger-peninsula, and also the old Greco-Russian name for the »Northmen», the Varegians (Swedes-Norwegians). Etymologically thereby arises a parallel to the system names Cambrian-Ordovician-Silurian which are also derived from old folk-names. *BA.*

Brotzen, F.: Stratigraphical studies on the Triassic vertebrate fossils from Wadi Raman, Israel, — KVA, Arkiv f. Min. o. Geol., 2, pp. 191—217, 5 text-figs., 7 plates. Uppsala 1956.

Brotzen, Fritz & Pożaryska, Krystyna: The Paleocene in Central Poland. — Acta Geol. Polon., 7, pp. 273—280. Polish summary pp. 278—280, Russian summary p. 280. Warszawa 1957.

Cobb, James C. & Kulp, J. Laurence: Age of the Swedish kolm. — Bull. Geol. Soc. Amer., 68, p. 1711. Baltimore 1957.

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Engström, Gustaf: Nya rön om berggrunden i Gävle [New observations about the bedrock in Gävle]. — Naturvännernas Fören. i Gävle 10 år, pp. 22—25. Göteborg 1956.

Some new observations of solid rocks of dolerite as well as Jotnian and Cambrian sandstones in the town of Gävle are given. *WL.*

Jaanusson, Valdar: Untersuchungen über den oberordovizischen Lyckholm-Stufenkomplex in Estland [Investigations of the Upper Ordovician Lyckholm Stage complex in Esthonia]. — BGIU, 36, pp. 369—400, 4 text-figs., 1 plate. English abstract p. 369. Uppsala 1956. Also as Publ. Palaeont. Inst. Univ. Uppsala, 12.

Jux, Ulrich: Die Riffe Gotlands und ihre angrenzenden Sedimentationsräume [The reefs of Gotland and their lateral sediments]. — Acta Univ. Stockh., Stockholm Contr. in Geol., 1, pp. 41—90, 11 text-figs., 6 plates. English summary pp. 41—42. Stockholm 1957.

Köster, Erhard: Aufbau und Sedimentationsrhythmen der Kågerödformation in der Bohrung Klappe im nordwestlichen Schonen [Stratigraphy and sedimentation rhythm of the Kågeröd Series in the boring of Klappe in NW Scania]. — GFF, 78, pp. 463—502, 25 text-figs. Stockholm 1956. Also as Skr. fr. Min.- o. Pal.-Geol. Inst., Lund, 31.

Lamont, Archie & Lindström, Maurits: Arenigian and Llandeilian cherts identified in the Southern Uplands of Scotland by means of conodonts, etc. — Trans. Edin. Geol. Soc., 17: 1, pp. 60—70, 1 text-fig., 1 plate. Aberdeen 1957. Also as Skr. fr. Min.- o. Pal.-Geol. Inst., Lund, 35.

Lannerbro, Ragnar: Ett stenfynd [A boulder find]. — Skansvakten, 41, p. 21, 1 text-fig. Mora 1956.

A boulder of Jotnian Dala sandstone containing a rounded cast of a solitary conglomerate pebble is briefly described. *WL.*

Larsson, Ingemar: Ripple marks i underkambrisk sandsten NV om Simrishamn [Ripple marks in Lower Cambrian sandstone NW of Simrishamn]. — SGÅ, 33, pp. 172—176, 5 text-figs. Lund 1957.

Different types of ripple marks are described. Their direction was measured but it is not possible to reconstruct any shore contour from these measurements. Wind-polished facettes indicate a wind-direction from about NW. *JL.*

Lindström, M.: Om de kaledoniska veckningarna vid Torneträsk [On the Caledonian foldings at Torneträsk]. — NGT, 36, p. 78. Bergen 1956.

Several separate tectonic phases of the Caledonian orogeny are stated to be common to two areas in the neighbourhood of Lake Torneträsk, Northern Sweden. *WL.*

Lindström, Maurits: Tectonics of the area between Mt. Keron and Lake Allesjaure in the Caledonides of Swedish Lapland. — Lunds Univ. Årsskr., N. F., Avd. 2, 53: 11. K. Fysiogr. Sällsk. Handl., N. F., 68: 11, 33 pp., 33 text-figs., 2 plates. Lund 1957. Also as Publ. fr. the Inst. of Min., Pal., and Quatern. Geol., Univ. of Lund, Sweden, 37.

Linnman, Gunnel: Billingen — berget i förgrunden [Billingen — the mountain in the foreground]. — Gullkornet, published by AB Gullhögens Bruk, Skövde, 7: 1, pp. 10 — 12, 7 text-figs. Stockholm 1957. Also in Västgöta Korrespondenten, October 21, 1957.

A short review of the geological history of Mount Billingen and the exploiting of its resources in old, present, and coming time. *GL.*

Martinsson, Anders: Kambriska sandstensgångar och ordoviciska fossilförande block i Nylands skärgård [Cambrian sandstone dikes and Ordovician fossil-bearing boulders in the archipelago of Nyland]. — Nordenskiöldsamf. Tidskr., 16, pp. 89—102, 6 text-figs. English abstract p. 102. Helsingfors 1956.

Martinsson, Anders: Neue Funde kambrischer Gänge und ordovizischer Geschiebe im südwestlichen Finnland [New finds of Cambrian dikes and Ordovician boulders in south-western Finland]. — BGIU, 36, pp. 79—105, 10 text-figs., 2 plates. English abstract p. 79. Uppsala 1956. Also as Publ. Palaeont. Inst. Univ. Uppsala, 8.

Martna, Jüri: Notes on the Upper Ordovician and Lower Silurian of the Tapa district, Estonia. — GFF, 79, pp. 21—34, 5 text-figs. Stockholm 1957.

af Petersens, Lennart: Västgötaberg. En bildsvit [Mountains in Västergötland. A series of pictures]. — STÅ, 1957, pp. 41—48, 10 text-figs. Stockhol 1957.

Several of the photographs also illustrate the geology of the mountains. *WL.*

Polkanov, A. A.: Geologija Choglandija-Iotnija Baltijskogo ščita i problem dokembrijskogo pereryva [The Hoglandian-Jotnian geology of the Balti shield and the pre-Cambrian unconformity]. — Izvestija Akademii Nauk SSSR Serija Geologičeskaja, 1956: 1, pp. 5—28, 11 text-figs. Moskva 1956.

Rein, U.: Pollenanalytische Untersuchungen an mitteleuropäischen Braunkohlenvorkommen des Miozäns [Pollenanalytical investigations of occurrence of Miocene lignite in Central Europe]. — GP, 1: 2, pp. 108—114, 1 text-fig Uppsala 1956.

Reyment, R. A.: On the occurrence of Santonian in northeastern Nigeria. — Acta Univ. Stockh., Stockholm Contr. in Geol., 1, pp. 35—40, 1 text-fig., plate. Stockholm 1957.

Reyment, R. A.: On the stratigraphy and palaeontology of the Cretaceous c Nigeria and the Cameroons, British West Africa. — GFF, 78, pp. 17—96, text-figs. Stockholm 1956. Also as academical dissertation (Stockholm).

Stenström, Seth: Contribution to discussion after a lecture by Helge Gry Wealdenaflejringerne på Bornholm, deres stratigrafi og tektonik [The Wealde deposits on Bornholm, their stratigraphy and tectonics]. — Medd. fr. Dans Geol. Foren., 13, p. 140. København 1956.

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Tjernvik, Torsten E.: On the early Ordovician of Sweden. Stratigraph and fauna. — BGIU, 36, pp. 107—284, 45 text-figs., 11 plates. Uppsala 195 Also as Publ. Palaeont. Inst. Univ. Uppsala, 9.

(Tokunaga, S. & Yamasaki, J.): Palynological investigations in Japa Palynological investigations of Tertiary lignite and coal. — GP, 1: 2, pp. 157—159. Uppsala 1956.

Troelsen, J. C.: The Cretaceous system in Denmark and Sweden. — X Congr. Geol. Int. Resumenes de los trabajos presentados, p. 348. Mexico 195

Tryggvason, Tómas: The gabbro bombs at lake Graenavatn. — BGI 38, pp. 1—5, 1 text-fig. Uppsala 1957 (1960).

PALEOBOTANY

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Deunff, J.: Progrès récents de nos connaissances sur les microplancto fossiles à Hystrichosphères des mers Primaires [Recent progress of our kno ledge of fossil microplankton with Hystrichosphaerids in Paleozoic seas]. — GP, 1: 2, pp. 79—84, 19 text-figs. Uppsala 1956.

Erdtman, G. & Vishnu-Mittre: On terminology in pollen and spore morphology. — The Paleobotanist, 5, pp. 109—111, 1 text-fig. Lucknow 1956 (1957).

Florin, Rudolf: Notes on cordaitean fructifications from the coal-measures of north-western Spain. — Acta Hort. Berg., 17, pp. 223—228, 2 plates. Uppsala 1957.

Horn af Rantzien, Henning: An annotated check-list of genera of fossil Charophyta. — Micropaleontology, 2, pp. 243—256. New York 1956.

Horn af Rantzien, H.: Charofyter — ledfossil för korrelation av sötvattensavlagringar [Charophytes — guide-fossils for the correlation of fresh-water deposits]. — NGT, 36, p. 77. Bergen 1956.

The possibilities of using the gyrogonites of the charophytes as stratigraphic markers at the correlation of especially Mesozoic and Tertiary fresh-water deposits are emphasized. *WL.*

Horn af Rantzien, Henning: Morphological terminology relating to female charophyte gametangia and fructifications. — BN, 109, pp. 212—259. 1 text-fig. Lund 1956.

Horn af Rantzien, Henning: Nitellaceous charophyte gyrogonites in the Rajmahal Series (Upper Gondwana) of India with notes on the flora and stratigraphy. — Acta Univ. Stockh., Stockholm Contr. in Geol., 1, pp. 1—30, 14 text-figs., 3 plates. Stockholm 1957.

Kolbe, R. W.: Zur Phylogenie des Raphe-Organs der Diatomeen: *Eunotia* (*Amphicampa*) *eruca* Ehr. [Contribution to the phylogeny of the raphe of the diatoms: *Eunotia* (*Amphicampa*) *eruca* Ehr.] — BN, 109, pp. 91—97, 15 text-figs. Lund 1956.

Lundblad, Britta: On the presence of the genus *Pseudotorellia* (*Ginkgophyta*) n the Rhaetic of N. W. Scania. — GFF, 79, pp. 759—765, 1 text-fig., 1 plate. Stockholm 1957.

Lundblad, Britta: On the stratigraphical value of the megaspores of *Lycotrobus scottii.* Preliminary report of some new finds and their interpretation. — SGU, C 547 [= Årsb. 50 (1956), N:o 3], 12 pp., 1 text-fig., 1 plate. Stockholm 1956. Also in GP, 1: 3. Uppsala 1958.

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Sen, J.: X-ray diffraction study of inorganic structural units in a fusinized ossil plant (*Vertebraria indica*). — GFF, 79, pp. 251—256, 2 text-figs. Stockholm 957.

Sen, J. & Basak, R. K.: The chemistry of ancient buried wood. — GFF, 9, pp. 737—758, 1 plate. Stockholm 1957.

Vishnu-Mittre: *Masculostrobus Sahnii* sp. nov., a petrified conifer male con producing three-winged and one- and four-winged abnormal pollen grain from the Jurassic of the Rajmahal Hills, Bihar. — GP, 1: 2, pp. 99—107, 2 text-figs. Uppsala 1956.

PALEOZOOLOGY

Bergenhayn, J. R. M.: Ur fåglarnas hävder [From the history of the birds] — VoV, 6, pp. 27—32, 2 text-figs. Göteborg 1956.

Popular account of the fossil birds and their origin from older groups of animals. *W*

Bohlin, Birger: Förhistoriska djur [Prehistoric animals]. — Fakta, 2, p 134—137, 24 text-figs. Norrköping 1956.

Brief account of the geological development of animal life and the origin of man. *W*

Bohlin, Birger: The dorsal and lateral sensory fields in the Osteostra parts of the internal ear? — Zool. Bidrag fr. Uppsala, 31, pp. 205—209, text-figs. Uppsala 1956. Also as Publ. Palaeont. Inst. Univ. Uppsala, 11.

Boucot, Arthur J.: Revision of some Silurian and early Devonian spiriferi genera and erection of Kozlowskiellinae, new subfamily. — Senck. Leth., 3 pp. 311—334, 3 text-figs., 3 plates. Frankfurt am Main 1957.

Hedeina crispa (Linnaeus 1758) from the Eke marl, near Näs church, Gotland, described and figured. *WL.*

Bystrow, A. P.: The microstructure of dermal bones in Arthrodires. — Act Zool., 38, pp. 239—275, 25 text-figs. Stockholm 1957 (1958).

Deevey Jr, Edward S.: Moafåglarnas undergång [The extinction of the m birds]. — Gåtor i djurens värld, lösta och belysta av zoologisk forskning tjugonde seklet, pp. 98—103. Stockholm 1957.

According to C 14-determinations *Dinornis* together with *Euryapteryx* still lived New Zealand in about 1300 A. D. *WL.*

Degerbøl, Magnus: Från apa till människa [From ape to man]. — Gebe 136 pp., 50 text-figs. Stockholm 1957.

The relationships between ape and man are dealt with in the light of the fos finds. *WL.*

Gross, Walter: Über Crossopterygier und Dipnoer aus dem baltisch Oberdevon im Zusammenhang einer vergleichenden Untersuchung des Pore kanalsystems paläozoischer Agnathen und Fische [On Crossopterygians a Dipnoans from the Baltic Upper Devonian in connection with a comparati investigation of the pore canal system of Paleozoic Agnathians and fishe — KVA, Handl., Ser. IV, 5: 6, 140 pp., 124 text-figs., 16 plates. Uppsa 1956.

Groth, Arne: Notes on the chemical development of fossils. — Acta Uni Stockh., Stockholm Contr. in Geol., 1, pp. 31—34, 1 plate. Stockhol 1957.

Henningsmoen, Gunnar: A trilobite with North American affinities from the Upper Cambrian of Sweden. — BGIU, 37, pp. 167—172, 1 text-fig., 1 plate. Uppsala 1957. Also as Publ. Palaeont. Inst. Univ. Uppsala, 16.

Henningsmoen, Gunnar: The trilobite family Olenidae with description of Norwegian material and remarks on the Olenid and Tremadocian Series. — Skr. Norske Vidensk.-Akad. Oslo, I. Kl., 1957: 1, 303 pp., 19 text-figs., 31 plates. Oslo 1957.

In this monograph a description is also given of a new Swedish olenid species, *Parabolina kinnekullensis* n. sp., from Trolmen, Kinnekulle, Västergötland. *WL.*

Hintze, Lehi F. & Jaanusson, Valdar: Three new genera of asaphid trilobites from the Lower Ordovician of Utah. — BGIU, 36, pp. 51—58, 2 text-figs. Uppsala 1956. Also as Publ. Palaeont. Inst. Univ. Uppsala, 6.

Holmer, Uno & Mannsbach, Arvid Bernhard: Odontologische Untersuchung von Zähnen und Kiefern des Menschen aus der Steinzeit in Schweden [Odontological investigation of teeth and jaws of man from the Stone Age in Sweden]. — Odontol. Tidskr., 64, pp. 437—521, 47 text-figs. Swedish summary pp. 515—516. English summary pp. 516—517. Göteborg 1957.

Holmgren, Nils: On the fingers of the birds. — XIV Int. Congr. of Zool., Copenhagen, 5.—12. August 1953, Proc., p. 534. Disc. Steiner, ibid., p. 534. Copenhagen 1956.

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Hubendick, Bengt: Aktuella utvecklingslinjer inom naturvetenskapen. Zoologi. Systematik, morfologi och utvecklingslära [Current trends in natural cience. Zoology. Taxonomy, morphology, and evolution]. — SNFÅ, 9 (1955), pp. 193—198, 3 text-figs. Stockholm 1958.

The importance of modern paleozoology for the understanding of the mechanism f the geological evolution of animals is emphasized. *WL.*

Hörstadius, Sven: Aktuella önskemål inom svensk naturvetenskaplig forskning. Zoologi [Current needs in Swedish natural science. Zoology]. — Svensk Naturvetenskap 1956. SNFÅ, 10, pp. 225—228. Stockholm 1957.

The insufficient economical resources for *i. a.* Swedish paleozoological research are mentioned. *WL.*

Jaanusson, Valdar: Middle Ordovician ostracodes of Central and Southern Sweden. — BGIU, 37, pp. 173—442, 46 text-figs., 15 plates. Uppsala 1957. Academical dissertation. Also as Publ. Palaeont. Inst. Univ. Uppsala, 17.

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Jaanusson, Valdar: Proposed use of the plenary powers to suppress the generic name »*Asaphus*» as published by Brongniart in Desmarest, 1817, and to designate a type species in harmony with general usage for the genus »*Asaphus* Brongniart, 1822 (Class Trilobita). — Bull. of Zool. Nomenclature, 12, pp. 9 —96, 1 plate. London 1956.

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SVENSSON, HARALD: Analyse von Gletscherbewegungen mit Hilfe der tachygraphischen Kurve [Analysis of glacier movements with the aid of the tachygraphic curve]. — Z. f. Gletscherkunde und Glazialgeol., 3, pp. 249—253, 4 text-figs. Innsbruck 1956.

SVENSSON, HARALD: Iakttagelser av isskuring inom västliga delar av den nord-norske strandflaten [Observations of glacial striation in western parts of the North-Norwegian strandflat]. — NGT, 37, pp. 429—434, 3 text-figs. Bergen 1957.

Indubitable glacial striations in the skerries of the North-Norwegian coast indicate that the last glaciation covered the present coastal area of the region. The observations are significant regarding the discussion of refugia for arctic plants and animals during the last glaciation. *EF.*

SVENSSON, HARALD: Plastic casts in the examination of glacial striation. — GFF, 79, pp. 781—784, 2 text-figs. Stockholm 1957. Also as Lund Studies in Geogr., Ser. A, Phys. Geogr., 9.

SVENSSON, HARALD: Ra-moräner vid Helgelandskusten? [Ra-moraines at the coast of Helgeland?] — NGT, 37, pp. 275—278, 3 text-figs. Bergen 1957.

A well developed end moraine in the coastal area of the Trondheim region, Norway, may probably be paralleled with other moraines, believed to be of the same age as the Fennoscandian moraines. *EF.*

SVENSSON, SVEN: Skute-issjöns tappningsvägar och Näckten-issjöns avlopp. En issjöstudie i Centraljämtland [The drainage channels of the ice-dammed lake Skute and the outlet of the ice-dammed lake Näckten. A study of the ice-dammed lakes of Central Jämtland]. — Geographica, 31, pp. 246—260, 6 text-figs. English summary pp. 258—259. Uppsala 1957.

SWITHINBANK, CHARLES: The morphology of the ice shelves of western Dronning Maud Land. — Norsk Polarinstitutt, Norwegian-British-Swedish Antarctic Expedition, 1949—52, Scientific Results, III, Glaciology, I: A, pp. 1—37, 7 text-figs., 6 plates. Oslo 1957.

SWITHINBANK, CHARLES: The regime of the ice shelf at Maudheim as shown by stake measurements. — Norsk Polarinstitutt, Norwegian-British-Swedish Antarctic Expedition, 1949—52, Scientific Results, III, Glaciology, I: B, pp. 41—75, 8 text-figs., 2 plates. Oslo 1957.

TUNBERG, TORSTEN: Landö-issjön i mellersta Jämtland [The ice-dammed lake Landö in Central Jämtland]. — Geographica, 31, pp. 261—288, 20 text-figs. English summary p. 287. Uppsala 1957.

Wallén, C. C.: Inlandsisens ablationsförhållanden under avsmältningsskedet i de nordvästra fjälltrakterna [The ablation conditions of the inland ice during the period of deglaciation in the northwesterly regions of the mountains]. — GFF, 79, pp. 529—541, 1 text-fig. English summary pp. 540—541. Stockholm 1957. Also as Medd. fr. Geogr. Inst. vid Stockholms Högsk., 109.

Wright, Jr., H. E.: Stone orientation in Wadena drumlin field, Minnesota. — GA, 39, pp. 19—31, 5 text-figs. Stockholm 1957.

Åberg, Curt: Rullstensåsar och grustäkt [Glacifluvial eskers and gravel exploitation]. — Geogr. Notiser, 14: 1, pp. 3—13, 6 text-figs. Stockholm 1956.

A summary of structure and formation of different types of eskers is given according to A. Bergdahl's classification. Some aspects of the exploitation of the gravel are appended. *WL.*

GEOCHRONOLOGY

Antevs, Ernst: Geological tests of the varve and radiocarbon chronologies. — Journ. of Geol., 65, pp. 129—148, 3 text-figs. Chicago 1957.

Gejvall, N.-G.: C 14-laboratoriet i arbete [The C 14 laboratory at work]. — Svensk Naturvetenskap 1956. SNFÅ, 10, pp. 250—254. English summary p. 254. Stockholm 1957.

Gejvall, Nils-Gustaf: Radiokoldateringen i arkeologiens tjänst [The radiocarbon dating in the service of archaeology]. See Östlund, G., Gejvall, N.-G. & Lundqvist, G.

Granar, Lars: Dating of recent fluvial sediments from the estuary of the Ångerman river (The period 1850—1950 A. D.). — GFF, 78, pp. 654—658, 2 text-figs. Stockholm 1956.

Hult De Geer, Ebba: La déglaciation américaine selon la chronologie De Geer complétée par les méthodes américaines modernes. Corrélations avec la déglaciation scandinave [The American deglaciation according to De Geer's chronology completed by the modern American methods. Correlations with the Scandinavian deglaciation]. — Bull. Soc. Géol. de France, Sér. 6, 5. pp. 423—432, 2 text-figs. Paris (1955) 1956. Also as Data N:o 99 fr. Stockholms Högsk. Geokronol. Inst.

Hult De Geer, Ebba: La déglaciation d'Uppland-Åland et de la Mer Botnique avec une analyse orographique [The deglaciation of Uppland-Åland and the Gulf of Bothnia with an orographic analysis]. — Cahiers Géol., 39—40, pp. 385—406, 6 text-figs. St-Genix-s-Guiers 1957. Also as Data N:o 104 fr. Stockholms Högsk. Geokronol. Inst.

Hult De Geer, Ebba: Les bords glaciaires de 7500 B. C. en Amérique du Nord et la période de 550 ans retrouvée en Suède [The ice margins of 7500 B. C. in North America and the period of 550 years re-found in Sweden]. — Cahiers Géol., 41—42, pp. 1—12, 4 text-figs. St-Genix-s-Guiers 1957. Also as Data N:o 105 fr. Stockholms Högsk. Geokronol. Inst.

HULT DE GEER, E.: New datings with examples of De Geer's chronology. — NGT, 36, p. 73. Bergen 1956. Also as Data N:o 101 fr. Stockholms Högsk. Geokronol. Inst.

HULT DE GEER, E.: Nydatering av svenska issjöar samt Alleröd-Bölling-termalerna [New dating of Swedish ice-dammed lakes and of the Alleröd-Bölling thermals]. — GFF, 78, p. 351. Disc. Caldenius, Hult De Geer, ibid., pp. 351—352. Stockholm 1956. Also as Data N:o 102 fr. Stockholms Högsk. Geokronol. Inst.

According to new profiles and varve connexions in the Ragunda district (Borell, Offerberg) two different drainage varves, with an age difference of 84 years, have formerly been believed to represent the zero year in Gerard De Geer's time scale. The younger of them agrees with the zero number of Gerard De Geer's extension of the time scale southwards in Sweden. A change of the varve numbers is not necessary and would cause confusion.

In the discussion C. Caldenius emphasized that the older varve represents the great drainage at the bipartition of the Scandinavian ice, and thus is the real zero varve (*sensu* De Geer). The time scale must accordingly be adjusted by about 80 years. *EF.*

HULT DE GEER, EBBA: Old and new datings of Swedish ice lakes and the thermals of Bölling and Alleröd. — GFF, 79, pp. 93—100, 3 text-figs. Stockholm 1957. Also as Data N:o 103 fr. Stockholms Högsk. Geokronol. Inst.

HULT DE GEER, EBBA: Orographie et glaciation dans la vallée Baltique (en relation avec la datation de varves de la localité de Grudziadz et celle, au C 14, de l'interstadiaire de Bölling) [Orography and glaciation in the Baltic valley (in relation to the varve dating of the locality of Grudziadz and to the C 14 dating of the Bölling interstadial)]. — Cahiers Géol., 35—36, pp. 345—364, 4 text-figs. St-Genix-s-Guiers 1956. Also as Data N:o 100 fr. Stockholms Högsk. Geokronol. Inst.

HULT DE GEER, EBBA: Planetary geochronology. — Actes du V^{e} Congr. Int. de Chronométrie, pp. 455—488, 12 text-figs. French summary p. 486. German summary p. 488. 1956. Also as Data N:o 97 fr. Stockholms Högsk. Geokronol. Inst.

HUMBLA, PHILIBERT: Björkebåten [The boat from Björke]. — Hille vår hembygd, pp. 52—54, 2 text-figs. Gävle 1956.

According to pollen analysis by R. Sandegren this boat find in the parish of Hille, Gästrikland, derives its origin from abt. the year 100 A. D. *WL.*

JÄRNEFORS, BJÖRN: Isrecessionen inom Uppsalaområdet [Ice recession in the Uppsala region]. — GFF, 78, pp. 301—315, 5 text-figs., 4 plates. English abstract p. 301. Stockholm 1956.

LINNÉ, S.: Radiocarbon dates in Teotihuacán. — Ethnos, 21, pp. 180—193, 14 text-figs. Lund 1956.

LUNDQVIST, G.: C 14-analyser i svensk kvartärgeologi 1955—57 [C 14 analyses in Swedish Quaternary geology 1955—57]. — SGU, C 557 [= Årsb. 51 (1957), N:o 8], 25 pp., 11 text-figs. English summary pp. 22—24. Stockholm 1957.

Lundqvist, G.: C 14-metoden i kvartärgeologien [The C 14 method in the Quaternary geology]. See Östlund, G., Gejvall, N.-G. & Lundqvist, G.

Lundqvist, Jan: C 14-dateringar av rekurrensytor i Värmland [C 14 datings of recurrence surfaces in Värmland]. — SGU, C 554 [= Årsb. 51 (1957), N:o 5], 22 pp., 3 text-figs. English summary pp. 18—21. Stockholm 1957.

Lundqvist, Jan: Geokronologiska undersökningar i Värmland [Geochronologic researches in Värmland]. — SGU, C 551 [= Årsb. 51 (1957), N:o 2], 28 pp., 6 text-figs., 1 plate. English summary pp. 24—27. Stockholm 1957.

Oldeberg, Andreas: Bågfyndet från Jokkmokk [The bow find from Jokkmokk]. — Norrbotten. Norrbottens Läns Hembygdsfören. Årsb. 1956, pp. 47—54, 4 text-figs. Luleå 1956.

According to pollen analysis by C. Larsson the bow may be dated to the younger Iron Age or later. *WL.*

Paneth, F. A. (F. W.): Beiträge der Isotopenforschung zur Chronologie der Welt [Contributions of the isotope research to the chronology of the world]. — SKT, 68, pp. 632—633. Stockholm 1956.

Schönbäck, Bengt: Fornforskning [Archaeological research]. — Fakta, 3, pp. 2—3, 3 text-figs. Norrköping 1957.

The Quaternary geology as well as the pollen analysis, the dendrochronology, and the C^{14}-method are briefly dealt with. *WL.*

Wahlberg, Erik: Ackjefyndet från Soukolojärvi [The ackja find from Soukolojärvi]. — Norrbotten. Norrbottens Läns Hembygdsfören. Årsb. 1956 pp. 80—92, 13 text-figs. Luleå 1956.

According to pollen analysis by C. Larsson the sledge is younger than abt. 1000 B. C. *WL.*

Wallén, C. C.: Årsringar och deras klimatiskt betingade variation [Tre rings and their variations due to climatic conditions]. — Ymer, 77, pp. 230—233. Stockholm 1957.

A review of recent investigations of tree rings by Bo Eklund, at the Forest Researc Institute of Sweden. The thickness variations of tree rings of spruce in northern Swede can be correlated in the first place with the temperature climate during the perio May 16th—July 31st, to a lesser degree with the precipitation (contrary to condition in southern Sweden). The frequency of cones also has an appreciable influence. *EH*

van Zinderen Bakker, E. M.: A pollen sequence in South Africa. — GF 1: 2, pp. 160—161. Uppsala 1956.

Östlund, H. G.: Stockholm natural radiocarbon measurements. I. — Science, 126, pp. 493—497, 1 text-fig. Washington 1957.

Östlund, Göte: Åldersbestämning med hjälp av kol-14. Tekniska data om metoden [Age determination by the aid of C 14. Technical data on th method]. See Östlund, G., Gejvall, N.-G. & Lundqvist, G.

Östlund, G., Gejvall, N.-G. & Lundqvist, G.: Åldersbestämning med hjälp av kol-14 [Age determination by the aid of C 14]. — Ymer, 76, pp. 220—236, 3 text-figs. Stockholm 1956.

A summary of the methods and first results of the Stockholm C 14 station. The station now operates with proportional counters (CO_2). Among the geological results obtained by the solid carbon method are the established Interglacial ages of some much discussed submorainic deposits of northern Sweden, preliminary datings of raised shore lines of the Baltic, pollenanalytical zones, and recurrence surfaces of peat profiles. *EF.*

CHANGES OF LEVEL

Cleve-Euler, Astrid: Was war der Svea älv? [What was the Svea River?] — Nova Acta Reg. Soc. Sci. Upsal., Ser. IV, 17: 1, 54 pp., 14 text-figs., 1 plate. Uppsala 1957. Also as Publ. of the Inst. of Quatern. Geol., Univ. of Uppsala, 3.

Florin, Sten: Stengärdet såsom kvartärgeologisk urkund [The cobble field Stengärdet as a Quaternary geological document]. See Teiling, Einar & Florin, Sten.

Fromm, Erik: Berichtigung zu einem Zitat in Astrid Cleve-Euler: »Was war der Svea Älv?» [Correction to a quotation in Astrid Cleve-Euler: »What was the Svea River?»] — GFF, 79, p. 588. Stockholm 1957.

Goudelis, V. K.: Lignes anciennes des côtes de la Mer Baltique et question des mouvements néotectoniques sur les territoires de régions Baltiques Sovietiques [Old shore lines of the Baltic and the question of young tectonic movements in the territories of the Sovietic Baltic provinces]. — XX Congr. Geol. Int. Resumenes de los trabajos presentados, p. 281. Mexico 1956.

Gross, H.: Zur Frage der postglazialen Niveauveränderungen im Ost- und Nordseegebiet. Nochmalige Stellungnahme des Rezensenten [On the Postglacial changes of level in the Baltic and North-Sea area. Further points of view of the reviewer]. — Peterm. Geogr. Mitt., 101, pp. 36—37. Gotha 1957.

Holmqvist, Wilhelm: Valöfyndet [The Valö find]. — K. Vitt. Hist. o. Antikv. Akad., Antikvar. Arkiv, 4, 65 pp., 35 text-figs. English summary pp. 63—65. Lund 1956.

Hvarfner, Harald: Endast före eller även under järnåldern? Om det norrländska inlandets stenålderskultur [Only before or also during the Iron Age? On the culture of the Stone Age in the interior of Norrland]. — Västerbotten, 38, pp. 70—115, 20 text-figs. Umeå 1957.

An account of the results of dwelling-place investigations which have been executed in Norrland in recent years on account of lake-regulation projects. *WL.*

Kukkamäki, T. J.: Korkeusmittausten lähtökorkeus [The reference surface of the elevations]. — Terra, 68, pp. 112—123, 7 text-figs. English summary p. 123. Helsinki 1956.

LINDBERG, STEN G.: Syndaflod — vattenminskning — landhöjning [Deluge — water-decrease — land-elevation]. In Introduction (pp. XLIV—XLVI) to Bengt Ferrner: Resa i Europa. En astronom, industrispion och teaterhabitué genom Danmark, Tyskland, Holland, England, Frankrike och Italien 1758—1762 [Travel in Europe. An astronomer, industrial spy, and frequenter of theatres through Denmark, Germany, the Netherlands, England, France, and Italy 1758—1762] (Cod. Holm. M 239). — Lychnos-Bibliotek, 14, LXXXVII + 572 pp., 30 text-figs., 3 plates. Uppsala 1956.

A compilation is made of Ferrner's observations during his European travel as to the »water-decrease» which led him to the idea of »the rising of the Swedish shield». *WL.*

MEŠČER'AKOV, J. A. & NEJŠTADT, M. I.: Novye dannye o poslelednikovom podn'atii Baltijskogo ščita [Recent data on Postglacial rising of Baltic Shield]. — Izvestija Akademii Nauk SSSR, Serija Geografičeskaja, 1957: 2, pp. 143—147, 2 text-figs. Moskva 1957.

MUNTHE, HENR.: Professor Astrid Cleve-Eulers Ansicht über die Entdeckung des Ancylussees [Professor Astrid Cleve-Euler's opinion as to the discovery of the Ancylus Lake]. — GFF, 79, pp. 588—589. Stockholm 1957.

MUNTHE, HENR.: Till frågan om Ancylusvallen på Laubackar [To the question of the Ancylus beach on Laubackar]. — Gotlands Allehanda, April 4th, 1957, 8 pp. (reprint), 1 text-fig. Visby 1957.

On account of the destruction of the Ancylus beach on the place mentioned by exploitation of the gravel, a brief review is given of some principal lines in the Late-Quaternary history of Gotland. *WL.*

NIKLASSON, NILS: Torslanda i forntiden [Torslanda in prehistoric time]. — Torslanda. En sockenskildring, pp. 37—60, 11 text-figs. Lund 1956.

As a background to a description of the prehistoric cultural periods a brief account is given of the changes of level in the region. *WL.*

VON POST, LENNART †: The ancient sea fiord of the Viskan Valley. Chapter II. The shore marks. — GFF, 78, pp. 101—121, 16 text-figs. Stockholm 1956.

SAURAMO, MATTI: A reply to Professor Henr. Munthe. — GFF, 78, pp. 563—567. Stockholm 1956.

TEILING, EINAR: Stengärdet i forskning och sägen [The cobble field Stengärdet in research and tradition]. See Teiling, Einar & Florin, Sten.

TEILING, EINAR & FLORIN, STEN: Stengärdet vid Kungsör [The cobble field Stengärdet at Kungsör]. — SN. Sv. Naturskyddsfören. Årsb., 47, pp. 46—56, 4 text-figs. Uddevalla 1956.

Description of a shore deposit on the Köping esker, Middle Sweden. In the transition between the Ancylus and Litorina stages the esker formed a highly exposed island in the Baltic, and the esker material was partly eroded and redeposited as shore ridges of cobble stones. *EF.*

WENNER, CARL-GÖSTA: Postscript on rock beaches. — GFF, 78, p. 121. Stockholm 1956.

WERTH, E.: Zur Frage der postglazialen Niveauveränderungen im Ost- und Nordseegebiet. Erwiderung auf das Referat von H. Gross über das Buch von Emil Werth »Die Litorinasenkung und die steinzeitlichen Kulturen in Rahmen der isostatischen Meeresspiegelschwankungen des nordeuropäischen Postglazials» in Peterm. Mitt. 1956, H. 1, S. 50 [On the Postglacial changes of level in the Baltic and North-Sea area. Reply to the review by H. Gross of the book by Emil Werth »The Litorina sinking and the cultures of the Stone Age within the scope of the isostatic changes of sea level of Northern Europe in Postglacial time» in Peterm. Mitt. 1956, H. 1, p. 50]. — Peterm. Geogr. Mitt., 101, pp. 35—36. Gotha 1957.

ÄYRÄPÄÄ, AARNE: Den yngre stenålderns kronologi i Finland och Sverige [Chronology of the younger Stone Age in Finland and Sweden]. — Finskt Museum, 62, pp. 5—52, 38 text-figs. German summary pp. 48—52. Helsingfors 1955 (1956).

BIOGEOLOGY

AARIO, LEO: Climatic changes and cultural geographic development. — Int. Geogr. Union, Proc. VIIIth General Assembly and XVIIth Int. Congr., Washington, D. C., August 8—15, 1952, pp. 265—268. Washington 1957.

ALBERTSON, NILS (†): Floran i Dala socken på nordöstra Falbygden [The flora of the parish of Dala in the northeastern Falbygden district]. — SBT, 51, pp. 287—316. Uppsala 1957.

A brief review is given (by H. Sjörs) of the geology of the parish, situated in an area of Cambro-Silurian rocks in SW Sweden, together with notes of geological interest regarding several plants. *WL.*

ALMESTRAND, ASTA: Immeln [Lake Immeln]. — Skånes Natur, 44, pp. 45—59, 11 text-figs. Lund 1957.

In connection with a description of the vegetation of the lake some statements are given as to the geology of the district. *WL.*

ANDERSSON, HARRY: Bidrag till Skånes flora. 50. Floran i Rya socken [Contributions to the flora of Scania. 50. The flora of the parish of Rya]. — BN, 109, pp. 325—348, 15 text-figs. Lund 1956. Also as Medd. fr. Lunds Botan. Mus., No. 113.

Remarks on subsoil geology and vegetation (occurrence of dolerite etc.). *BL.*

ARDÖ, PAUL: Studies in the marine shore dune ecosystem with special reference to the dipterous fauna. — Opusc. Ent., Suppl. 14, 255 pp., 82 text-figs. Malmö 1957. Also as academical dissertation (Lund).

ARMAGNAC, ALDEN: Fallet med den felande länken [The case of the missing link]. — Det Bästa, 14: 12, pp. 31—35, 3 text-figs. Stockholm 1956.

Deals with the unveiling of the »Piltdown man» as a forgery. *WL.*

ARNBORG, TORE: Mark och vegetation inom Bensjö-området samt några synpunkter på trädslagsvalet [Soil and vegetation in the Bensjö area and some conclusions regarding the choice of tree species]. — Norrl. Skogsvårdsförb. Tidskr. f. år 1956, pp. 560—597, 18 text-figs. English summary pp. 595—596. Stockholm 1956. Also as Medd. fr. Sällsk. f. prakt. Skogsförädling, Uppsala, 83.

Ata, Pertev: The incidence of fluorosis and caries in teeth of the first and second dentitions in Isparta, Turkey. — Odont. Tidskr., 65, pp. 501—508, 4 text-figs. Göteborg 1957.

Backlund, Helge O.: Aspects and successions of some grassland vegetation in the Rukwa Valley, a permanent breeding area of the Red Locust. — Oikos, Suppl. 2, 132 pp., 35 text-figs. Odense 1956.

Barnett, Lincoln: Världen vi lever i. En bok om jordens och livets utveckling [The world we live in. A book on the evolution of earth and life]. With an introduction by Harry Martinson. Swedish translation by Anna Lisa Hanström. Edited by Bertil Hanström. — Allhems förlag, 305 pp., 345 text-figs., 18 plates. Malmö 1957.

A series of scientific articles, published in Life, U. S. A., later issued as a book, translated into several languages, also into Swedish. Lincoln Barnett, an American journalist, wrote the articles which were later revised by experts. The text is accompanied by photos and drawings. The book is written with special regard to American circumstances. *GL.*

Bergeron, Tor, Fries, Magnus, Moberg, Carl-Axel & Ström, Folke: »Fimbulvinter» [»Fimbul winter»]. — Fornvännen, 51, pp. 1—18, 2 text-figs. German summary pp. 16—18. Uppsala 1956.

Berggren, Greta: Växtmaterial från träskboplatsen i Dagsmosse [Plant material from the lacustrine dwelling of Dagsmosse]. — SBT, 50, pp. 97—112, 4 plates. Uppsala 1956.

Carpological study based on material from the Middle Neolithic sites at Alvastra, Östergötland (age acc. to C^{14}-analysis 4 180 ± 130 years). Special attention is paid to the occurrence of cereals and weeds, and the author gives a list of species, containing *i. a. Hordeum vulgare* ssp. *polystichum* (six-rowed barley), *Triticum* sp. (wheat), *Secale cereale* (rye?), and *Avena sativa* (oats?). The find of a fragmentary twig of *Picea abies* supports previous evidence on its immigration obtained by pollen diagrams. *BL.*

Berglund, Björn: Eken. Drag ur den blekingska ekskogens historia [The oak. Features in the history of the Blekinge oak forest]. — Natur i Blekinge, pp. 98—108, 8 text-figs. Uppsala 1957.

Popular account of the Post-Glacial history of the oak in the province of Blekinge with remarks on its distribution during historical time. *BL.*

Berglund, Björn: Skärgården kring Karlskrona [The Karlskrona archipelago]. — Natur i Blekinge, pp. 299—313, 8 text-figs. Uppsala 1957.

Popular account with remarks on the geographical evolution of the Baltic, the oscillation of sea level in S. Sweden during the last glaciation, and the Post-Glacial history of the province of Blekinge. *BL.*

Bjerke, Sten: Nogle træk af de sydskandinaviske løvskoves udvikling gennem de sidste århundreder [Some features in the development of the deciduous forests in Southern Scandinavia during the last centuries]. — Dansk Dendrol. Årsskr., 4, pp. 373—413, 21 text-figs. English summary p. 413. Odense 1957.

Björkman, Gunnar: Växtvärlden i Orsa [The flora of Orsa]. — Orsa. En sockenbeskrivning, 3, pp. 9—32, 10 text-figs. Stockholm 1957.

The connection between flora and geology of the parish is touched upon. *WL.*

Bloom, G., Glömme, J. & Swensson, Å.: The importance of an accurate size determination of fine particles when investigating their biological effects. — EM, pp. 250—251, 2 text-figs. Uppsala 1957.

Brinck, Per: Onychophora. A review of the South African species, with a discussion on the significance of the geographical distribution of the group. — South African animal life. Results of the Lund Univ. Exp. in 1950—1951, 4, pp. 7—32, 13 text-figs. Uppsala 1957.

Brown, Clair A.: Report on plant microfossil round table. — GP, 1: 2, pp. 161—162. Uppsala 1956.

Brundin, Lars: Die bodenfaunistischen Seetypen und ihre Anwendbarkeit auf die Südhalbkugel. Zugleich eine Theorie der produktionsbiologischen Bedeutung der glazialen Erosion [The bottom-faunistic lake types and their applicability on the southern hemisphere. Likewise a theory for the production-biological importance of the glacial erosion]. — Fishery Board of Sweden, Inst. of Freshwater Research, Drottningholm, Rep. No. 37, pp. 186—235. Lund 1956.

Collis, John Stewart: Träden och människorna [Trees and men]. — Natur och Kultur, 198 pp. Stockholm 1956.

Chapters of geological interest deal with the evolution of plants, how soil is formed and improved, the circulation of water, and the influence of the trees on erosion. *WL.*

Curry-Lindahl, Kai: Norrlands djurvärld. I. Vikaren, berguven, harren m. fl. [The fauna of Norrland. I. Rough seal, eagle owl, grayling, etc.] — Norrl. Tidskr., 1957: 4, pp. 33—37, 9 text-figs. Härnösand 1957.

A general survey is given of the zoogeography of Norrland together with distribution maps of lynx, eagle owl, Lapp titmouse, and hooper. *WL.*

Curry-Lindahl, Kai: Några djurarters utbredning [The distribution of some species of animals]. — Atlas över Sverige. Djurgeografi, 45—46, 8 pp., 10 text-figs., 17 coloured maps. English summary p. 8. Stockholm 1957.

Dahl, Erik: Ecological salinity boundaries in poikilohaline waters. — Oikos, 7, pp. 1—21, 4 text-figs. Copenhagen 1956.

Dahm, Hans-Diether: Diatomeenuntersuchungen zur Geschichte der westlichen Ostsee [Diatom investigations to the history of the western Baltic]. — Meyniana, 5, pp. 7—50. Kiel 1956.

Damman, A. W. H.: The South-Swedish *Calluna*-heath and its relation to the *Calluneto-Genistetum.* — BN, 110, pp. 363—398, 7 text-figs. Lund 1957.

Du Rietz, G. Einar: Linnaeus as a phytogeographer. — Vegetatio, Acta Geobot., 7, pp. 161—168, 1 text-fig. Den Haag 1957.

Du Rietz, G. Einar: Linné som myrforskare [Linnaeus as a paludologist]. — UUÅ, 1957: 5, 80 pp., 10 plates. English summary pp. 60—69. Uppsala 1957. Also as Inbjudningar t. doktorsprom. i Uppsala Univ. aula 1957. Bifogade skr., 3.

Ekdahl, Åke: Skorven (*Mesidothea entomon*) funnen i sjön Anten i Västergötland [The isopod *Mesidothea entomon* found in Lake Anten in Västergötland]. — Fauna och Flora, 52, pp. 158—160. Uppsala 1957.

Three specimens of this relict crustacean, 15 mm in length, were obtained from depths of 15—18 m. Earlier *Mysis relicta* was known from this lake. *WL.*

Eklund, Bo: Ett förbandsförsök i tallskog. Några erfarenheter från ett 50-årigt skogsodlingsförsök på kronoparken Granvik [An experiment in sowing and planting pine with different spacings. Experience from a 50-year regeneration experiment in the Crown Forest of Granvik]. — Medd. fr. Statens Skogsforskn. Inst., 46: 10, 98 pp., 26 text-figs. English summary pp. 96—98. Stockholm 1956 (1957).

Eklund, Bo: Om granens årsringsvariationer inom mellersta Norrland och deras samband med klimatet [On the annual ring variations in spruce in the centre of Northern Sweden and their relation to climatic conditions]. — Medd. fr. Statens Skogsforskn. Inst., 47: 1, 63 pp., 20 text-figs. English summary pp. 56—63. Stockholm 1957 (1958).

Eklund, Bo: Om mätning av årsringar och analys av årsringsmaterial särskilt med hänsyn till årsringsbreddens klimatiskt betingade variation. Sammanfattande redogörelse [On measuring of annual rings and analysis of annual-ring material especially with regard to the climatically conditioned variation of the width of the annual rings. Summary account]. — 12 pp. Stockholm 1957. Academical dissertation (Stockholm).

Brief account of the content of six earlier papers published in Medd. fr. Stat. Skogsforskn. Inst. 1949—57, all with English summaries. *WL.*

Erdtman, G.: Current trends in palynological research work. — GP, 1: 2, pp. 127—139, 3 text-figs., 2 plates. Uppsala 1956.

Erdtman, G.: Literature on palynology. XIX. — GFF, 79, pp. 601—736. Stockholm 1957. Also in Grana Palynologica, 1: 3. Uppsala 1958.

Erdtman, G.: »LO-analysis» and »Welcker's Rule», a centenary. — SBT, 50, pp. 135—141, 4 text-figs., 2 plates. Uppsala 1956.

Erdtman, G.: On some aspects and prospects of basic palynology with particular reference to Quaternary geology. — Actes du IV Congr. Int. du Quaternaire, Rome-Pise, Août-Septembre 1953, 1, pp. 448—449. Roma 1956.

Erdtman, G.: On the risks of overstressing the denominations of fossil spores as illustrated by a paper on the former distribution of *Lophosoria* (»*Cyathea annulata*»). — SBT, 51, pp. 611—613. Uppsala 1957 (1958).

ERNVIK, ARVID: Om Visnums-Kils socken. Natur och djurliv [On the parish of Visnums-Kil. Nature and animal life]. — Socknen vid Kilsviken. Minnesskr. vid Visnums-Kils kyrkas 200-årsjubileum 1956, pp. 12—19, 2 text-figs. Ystad 1956.

Notes on the fauna of the parish in its connection with the geological conditions. *WL.*

ESPING, LARS-ERIK: De sista uroxarna [The last aurochsen]. — SN. Sv. Naturskyddsfören. Tidskr., 48, pp. 146—147. Uddevalla 1957.

Some historical notes are given on the extinction of *Bos primigenius* and on the occurrence of skeleton remnants of it in European museums. The last specimen died in 1627 in the Jaktorów forest in Poland. *WL.*

ESPING, LARS-ERIK: Lake Hornborgasjön, in the province of Västergötland, South Western Sweden. — Int. Union for the Conserv. of Nature and Nat. Res. Sixth Techn. Meeting. Edinburgh June 1956. Proc. and Papers, p. 167. London 1957.

FAGERLIND, FOLKE: Aktuella utvecklingslinjer inom naturvetenskapen. Botanik. Floristik och historisk växtgeografi [Current trends in natural science. Botany. Floristic and historical phytogeography]. — SNFÅ, 9 (1955), pp. 223—224. Stockholm 1956.

The importance of the study of fossil floras and, for younger floras, of the pollen analysis for the historical phytogeography and for geological problems is particularly emphasized. *WL.*

FAGERLIND, FOLKE: Aktuella önskemål inom svensk naturvetenskaplig forskning. Botanik [Current needs in Swedish natural science. Botany]. — Svensk Naturvetenskap 1956. SNFÅ, 10, pp. 231—237. Stockholm 1957.

An account of the situation and need of improvements in different branches of botany, of which the microbiology and palynology (incl. pollen analysis) are of special interest for the geological science. *WL.*

FALCK, KURT, HAMMARSTEN, OLOF, LINNELL, TORE & PEHRSSON, TORSTEN: Biologi för gymnasiet. Allmänna linjens sociala gren. Ring IV^4 och III^3 [Biology for the gymnasium. The social branch of the general side. Classes IV^4 and III^3]. — Svenska Bokförl., 185 pp., 100 text-figs. Stockholm 1957.

Chapters on the theory of evolution and the relationships of the vertebrates on pp. 59—88. *WL.*

FLORIN, MAJ-BRITT: Insjöstudier i Mellansverige. Mikrovegetation och pollenregn i vikar av Östersjöbäckenet och insjöar från preboreal tid till nutid [Lake studies in Central Sweden. Microvegetation and pollen rain in inlets of the Baltic basin and in lakes from Pre-Boreal time to the present day]. — Acta Phytogeogr. Suec., 38, 29 pp., 10 text-figs. English summary pp. 25—28. Uppsala 1957. Academical dissertation (Uppsala). Also as Publ. of the Inst. of Quatern. Geol., Univ. of Uppsala, 5.

FLORIN, MAJ-BRITT: Plankton of fresh and brackish waters in the Södertälje area. — Acta Phytogeogr. Suec., 37, 144 pp., 35 text-figs., 21 plates. Uppsala 1957. Also as Publ. of the Inst. of Quatern. Geol., Univ. of Uppsala, 4.

Forsslund, Karl-Herman: Svenska myror. 15—19 [Swedish ants. 15—19]. — Entomol. Tidskr., 78, pp. 32—40, 5 text-figs. German summary pp. 39—40. Stockholm 1957.

Lasius bicornis, *Leptothorax corticalis*, and *Camponotus fallax*, found in Sweden, are probably to interpret as relicts from the Subboreal period of the Post-Glacial climate optimum. *WL.*

Fridén, Axel: Några intressanta skalbaggsfynd från Tåsjöberget [Some interesting finds of coleoptera from Mount Tåsjöberget]. — Zool. Revy, 19, pp. 24—25. Stockholm 1957.

Some species of coleoptera here have their most northerly localities in Sweden. *WL.*

Fridén, Axel: Sydberg i Ströms vattudal [South-facing mountains in Ströms vattudal]. — Zool. Revy, 18, p. 24. Stockholm 1956.

The occurrence of southern species of plants and insects, partly of a decidedly relict appearance, are reported from some south-facing mountains in the parish of Frostviken, Jämtland. *WL.*

Fries, Magnus: Bensjöområdet i skogshistorisk belysning. En pollenanalytisk undersökning från södra Jämtland [The Bensjö area as illustrated by its forest history. A pollen-analytical investigation from southern Jämtland]. — Norrl. Skogsvårdsförb. Tidskr. 1956, pp. 527—559, 6 text-figs., 1 plate. German summary pp. 555—557. Stockholm 1956 (1957).

Fries, Magnus: En högt belägen lokal för värmetidshassel i södra Jämtland [A high locality in southern Jämtland for hazel from the Post-Glacial climate optimum]. — SBT, 50, pp. 210—212. German summary p. 212. Uppsala 1956.

Gjaerevoll, Olav: The plant communities of the Scandinavian alpine snow-beds. — Det Kgl. Norske Vid. Selsk. Skr., 1956: 1, 405 pp., 80 text-figs., 6 plates. Trondheim 1956.

Granberg, Axel: Mellan Muonio och Torne älvar [Between the rivers Muonio and Torneå]. — Natur i Västerbotten och Norrbotten, pp. 418—429, 8 text-figs. Uppsala 1956.

Popular account; mainly botanical. *BL.*

Gross, H.: Die palynologische Forschung in Deutschland [The palynological research in Germany]. — GP, 1: 2, pp. 119—126. Uppsala 1956.

Halden, B. E.: Märkliga mineral- och bergartsfynd från markundersökningar invid kända förekomster av hassel och andra »kalkväxter» [Remarkable finds of minerals and rocks from soil investigations in the vicinity of known occurrences of hazel and other lime-exacting plants]. — NGT, 36, p. 76. Bergen 1956.

Brief summary of finds of rocks and minerals rich in lime made on account of the occurrence of certain plants. *WL.*

HALDEN, BERTIL E.: Oväntat fynd av *Aconitum* i södra Hälsingland [Unexpected find of *Aconitum* in Southern Hälsingland]. — SBT, 50, p. 216. Uppsala 1956.

A. septentrionale was earlier known from only three localities in Northern Hälsingland. The soil water at the new locality (Dropphäll) contained 8.3 mg Ca/l, possibly derived from amphibolite. *WL.*

HALDEN, BERTIL E.: Sveriges nordligaste hasselförekomster [The northernmost occurrences of hazel in Sweden]. — SBT, 50, pp. 212—216. Uppsala 1956.

Seven localities of hazel in Norrland are discussed with special regard to subsoil geology. *BL.*

HANNERZ, ERIK: Luleåtrakten — skogsberg och fågelsjöar [The Luleå district — woody mountains and bird-lakes]. — Natur i Västerbotten och Norrbotten, pp. 212—233, 15 text-figs. Uppsala 1956.

Some statements are given as to the geology of the district, especially its Quaternary geology. *WL.*

HANSON, TORE: Är den vanliga näbbmusen »glacial övervintrare» på Norges kust? [Has the common shrew »hibernated» during the last glaciation on the coast of Norway?] — Fauna och Flora, 51, pp. 1—9, 3 text-figs. English summary p. 8. Uppsala 1956.

HAWKES, JACQUETTA: Vi på jorden. En bok om människans väg [We on earth. A book on the way of man]. — Tidens Förl., 205 pp. Stockholm 1957.

A popular account of the evolution of animals from primitive forms towards man. *WL.*

HEDBERG, OLOV: A pollen-analytical reconnaissance in Tropical East Africa. — Oikos, 5: II, pp. 137—166, 5 text-figs., 5 plates. Copenhagen 1954. Also in Grana Palynologica, 1: 2. Uppsala 1956.

HEDLIN, BROR, JULIN, ERIK & PEKKARI, ALBERT: *Stratiotes*-sjöar i Norrbotten [*Stratiotes* lakes in Norrbotten]. — SBT, 51, pp. 317—343, 6 text-figs., 2 plates. English summary pp. 340—341. Uppsala 1957.

HEDLUND, RAGNAR: Glimt från Komosse [Glimpse of Komosse]. — SN. Sv. Naturskyddsfören. Tidskr., 47, pp. 118—120, 1 text-fig. Uddevalla 1956.

Popular account of an excursion to the raised bog Komosse with notes on its geologic structure. *WL.*

HEINONEN, LEO: Studies on the microfossils in the tills of the North European glaciation. — Ann. Acad. Sci. Fennicae, Ser. A, III, 52, 92 pp., 5 text-figs. Helsinki 1957. Also as Contr. fr. the Min. and Geol. Inst. of the Univ. of Helsinki (Helsingfors), 335 a.

HJELMQVIST, HAKON: Kulturväxternas äldsta historia i Sverige [The earliest history of cultivated plants in Sweden]. — SNFÅ, 9 (1955), pp. 286—297, 3 text-figs. English summary p. 297. Stockholm 1956.

Hjelmqvist, H.: Några anteckningar om bokskogen vid Nydala [Some notes on the beech forest at Nydala]. — Lustgården, 37—38, pp. 149—158, 3 text-figs. English summary p. 158. Uppsala 1957.

Holmquist, Charlotte: Några Ivösjö-studier [Some studies of Lake Ivösjön]. — Sv. Fiskeri Tidskr., 65, pp. 114—117, 5 text-figs. Lund 1956.

The conditions in the lake have been investigated with special regard to the glacial relicts *Mysis relicta*, *Pontoporeia affinis*, and *Pallasea quadrispinosa*. *WL.*

Hubendick, Bengt: Klot, vatten och liv. Populärvetenskapliga utblickar [Earth, water, and life. Popular scientific survey]. — AB Fack- och Specialböcker, 170 pp., 34 text-figs., 8 plates. Stockholm 1956.

Of geological interest are particularly the chapters »Snabblick på havet [Fast glance at the sea]», »Stilla havets puls, snäcklarver och vinglösa skalbaggar [Pulse of the Pacific, mollusc larvae, and apterous coleoptera]», »Våra 94 000 sjöar [Our 94,000 lakes]», and »Geografin, årmillionerna och djuren [The geography, the millions of years, and the animals]». *WL.*

Hultén, Eric: De amfiatlantiska växterna [The amphiatlantic plants]. — SBT, 51, pp. 19—35, 12 text-figs. English summary pp. 33—35. Uppsala 1957.

Jansson, Arne: Naturen kring Piteå [Nature around Piteå]. — Natur i Västerbotten och Norrbotten, pp. 204—211, 6 text-figs. Uppsala 1956.

Outlines of the Quaternary geology of the Piteå district, northernmost Sweden, are given and its influence on flora and fauna is briefly dealt with. *WL.*

Johansson, Karl Erik & Dreborg, Sten: Biologi. Del III A. Utvecklingslära, ämnesomsättningens fysiologi m. m. för allmänna linjens sociala gren IV^4 (III^3) [Biology. Part III A. Theory of evolution, physiology of the metabolism, etc., for the social branch of the general side IV^4 (III^3)]. — Natur och Kultur, 145 pp., 76 text-figs. Halmstad 1956.

In the chapter on the theory of evolution, pp. 68—92, the main features of the geological evolution are dealt with. *WL.*

Jonsson, Per N.: Fanns hassel i Halåsberget så sent som 1848—58 [Did hazel occur in the Halåsberget Mountain as late as 1848—58]? — Lits Hembygdsfören. Skriftser., 7, pp. 154—155. Östersund 1956.

Earlier reports on the occurrence of hazel in the south-facing mountain mentioned could not be verified in 1945. *WL.*

Jonsson, Per N.: Halåsberget, ett sydberg med ett 20-tal sydskandinaviska arter [Halåsberget, a south-facing mountain with some twenty South-Scandinavian species]. — Lits Hembygdsfören. Skriftser., 7, pp. 155—156. Östersund 1956.

To the list of earlier known plants from the mountain a number of new species are added. *WL.*

Jonsson, Per N.: Kärlväxter i Lits kommun. Försök till en artförteckning [Vascular plants in the commune of Lit. Attempt at a list of species]. — Lits Hembygdsfören. Skriftser., 7, pp. 59—161, 38 text-figs. Östersund 1956.

A chapter is devoted to some geological and topographical conditions affecting the geographical distribution of the plants. *WL.*

JUHLIN, ARNE: Naturförhållandena i Annerstad [The natural conditions in Annerstad]. — Annerstads Hembygdsfören. Årsskr., 1956, pp. 73—82, 4 text-figs. Växjö 1957.

Popular account of especially the vegetation together with a list of natural monuments in the parish. *WL.*

JULIN, ERIK: Sveriges östligaste hörn — i Haparanda bygd och skärgård [The easternmost corner of Sweden — in the Haparanda district and its archipelago]. — Natur i Västerbotten och Norrbotten, pp. 250—265, 10 text-figs. Uppsala 1956.

Popular account; mainly botanical. *BL.*

JULIN, ERIK & PEKKARI, SVANTE: Coastal waters in the region of Haparanda. — SBT, 50, pp. 348—360, 3 text-figs. Uppsala 1956.

VON KOENIGSWALD, G. H. R.: Möten med urtidsmänniskan [Face to face with primeval man]. Swedish translation by Herje Öberg. — Natur och Kultur, 194 pp., 48 text-figs., 20 plates. Stockholm 1957.

The well-known Dutch paleontologist describes the circumstances concerning the most important finds of fossil man, with special regard to ancient forms, viz. those from Java, China, and Africa. He mentions accompanying finds, paleontological as well as archeological, and concludes by outlining the origin of present primates. *GL.*

KOLBE, R. W.: Diatoms from Equatorial Indian Ocean cores. — Göteborgs Kungl. Vet.- o. Vitt.-Samh. Reports of the Swedish deep-sea expedition 1947—1948. Vol. IX. Sediment cores from the Indian Ocean. Fasc. I, pp. 1—50, 6 text-figs., 4 plates. Göteborg 1957.

KOLBE, R. W.: Fresh-water diatoms from Atlantic deep-sea sediments. — Science, 126, pp. 1053—1056, 2 text-figs. Washington 1957.

KREY, J.: Plankton. Productivity in the Baltic. — AB, 13, pp. 110—112. Copenhague 1956 (1958).

LAGERBERG, T.: Våra skogars utvecklingshistoria [The history of evolution of our forests]. — Handledning i skogshushållning [A guide to forestry]. Published by Norrlands Skogsvårdsförbund. Fifth edition, pp. 8—14, 1 text-fig. Stockholm 1956.

A brief description of the evolution of the vegetation, especially the forest, in Sweden in Post-Glacial time and of the phytogeographic regions of our country. *WL.*

LANGE, WOLFGANG: Grundproben aus Skagerrak und Kattegat, mikrofaunistisch und sedimentpetrographisch untersucht [Microfaunistic and sedimentpetrographic investigation of bottom samples from the Skagerrak and Kattegat]. — Meyniana, 5, pp. 51—86, 10 plates. Kiel 1956.

LEOPOLD, E. B.: Pollen size-frequency in New England species of the genus *Betula*. — GP, 1: 2, pp. 140—147, 1 text-fig. Uppsala 1956.

LEVRING, T. & FISH, G. R.: The penetration of light in some tropical East African waters. — Oikos, 7, pp. 98—109, 12 text-figs. Copenhagen 1956.

Liedberg, Åke: Membranfiltermetoden för bakteriologisk undersökning av vatten [The membrane filtration technique in the bacteriological examination of water]. — Nord. Hygien. Tidskr., 37, pp. 132—140, 3 text-figs. English summary p. 140. Stockholm 1956.

Lindquist, Armin: Zooplankton investigations in the Gulf of Bothnia. — AB, 13, pp. 114—115, 2 text-figs. Copenhague 1956 (1958).

Lindroth, Carl H.: Aktuella utvecklingslinjer inom naturvetenskapen. Zoologi. Ekologisk djurgeografi [Current trends in natural science. Zoology. Ecological zoogeography]. — SNFÅ, 9 (1955), pp. 198—203, 2 text-figs. Stockholm 1956.

Inter alia the importance of the ecological zoogeography for the estimation of the conditions in the past with the aid of the subfossil fauna is discussed. *WL.*

Lindroth, Carl H.: The faunal connections between Europe and North America. — 344 pp., 72 text-figs. Uppsala 1957.

Linnman, Gunnel: Knacka liv i berget. Programserie från BBC, bearbetad för svensk skolradio [Put life into the rock. A series of programmes from BBC, adapted for Swedish school radio]. — Skolradio, H. 169 and 170, pp. 4—9, 22 text-figs., H. 177 and 178, pp. 26—31, 36 text-figs. Stockholm 1956 (1957).

A British Broadcasting series of six radio programmes for elementary school children, translated and adapted for Swedish conditions. The textbooks have a popular exposition of the paleontological evolution from Cambrian to Pleistocene. *GL.*

Lundberg, Folke: Glacialmarina relikter i Västsverige [Glacial marine relicts in Western Sweden]. — Fauna och Flora, 52, pp. 137—155, 3 text-figs. Uppsala 1957.

A summary of the occurrence of glacial marine relicts in the lakes of Western Sweden. A special description is given of Lake Rinnen in the parishes of Brunskog and Boda, Värmland, in which *Mysis relicta* and *Limnocalanus macrurus* were recently found. *WL.*

Lundegårdh, Henrik: Klima und Boden in ihrer Wirkung auf das Pflanzenleben [Climate and soil in their effect upon the vegetation]. — 5th Ed. VEB Gustav Fischer Verlag, 584 pp., 145 text-figs., 2 plates. Jena 1957.

Lundman, Bertil: Stridsyxor och backtimjan [Battle-axes and wild thyme]. — Ymer, 77, pp. 223—229, 2 text-figs. German summary p. 229. Stockholm 1957.

Löve, Doris: Kanada från kust till kust — en botanisk översikt [Canada from coast to coast — a botanical survey]. — BN, 110, pp. 130—131. Lund 1957.

Brief review, with geological notes, of a lecture given in 1956 in the Botanical Society of Lund. *WL.*

Löve, Áskell & Löve, Doris: Cytotaxonomical conspectus of the Icelandic flora. — Acta Hort. Gotoburg., 20, pp. 65—291, 27 text-figs. Göteborg 1956.

Malmer, Nils & Olausson, Eric: Nya fynd av *Sphagnum Lindbergii* i södra Sverige [New finds of *Sphagnum Lindbergii* in Southern Sweden]. — BN, 109, pp. 83—90, 1 text-fig. English summary p. 89. Lund 1956.

MOLLSTEDT, BENGT: Orienterande undersökning av vattenanalyser med membranfilter [Introductory investigation about water examination by membrane filter]. — Nord. Hygien. Tidskr., 38, pp. 239—245. English summary p. 245. Stockholm 1957.

MUNTHE, HENR.: On the development of the Baltic herring in the light of the Late-Quaternary history of the Baltic. — KVA, Arkiv f. Zool., 9, pp. 333—341, 8 text-figs. Uppsala 1956.

MÅRTENSSON, OLLE: Bryophytes of the Torneträsk area, Northern Swedish Lappland. II. Musci. — KVA, Avhandl. i Naturskyddsärenden, 14, 321 pp. Uppsala 1956.

MÅRTENSSON, OLLE: Bryophytes of the Torneträsk area, Northern Swedish Lappland. III. General part. Review of the Torneträsk area and comments on the lists of Hepaticae and Musci. — KVA, Avhandl. i Naturskyddsärenden, 15, 94 pp., 12 text-figs., 2 plates. Geology pp. 13—15. Uppsala 1956.

NIKOLAEV, I.: Zooplankton in the central Baltic and in the Gulf of Riga in 1956. — AB, 13, pp. 112—114, 2 text-figs. Copenhague 1956 (1958).

NORDBORG, GERTRUD & INGEMAR: Bidrag till Skånes flora. 51. Fanerogamfloran i Vedby socken med speciell hänsyn till myrarna [Contributions to the flora of Scania. 51. The phanerogamic flora of the parish of Vedby with special reference to the bogs]. — BN, 110, pp. 83—121, 17 text-figs. Lund 1957. Also as Medd. fr. Lunds Botan. Mus., 115.

Contains also a short description of rocks and soils in the area investigated. *WL.*

NYHOLM, KARL-GEORG: Orientation and binding power of recent monothalamous foraminifera in soft sediments. — Micropaleontology, 3, pp. 75—76, 1 text-fig. New York 1957.

OLAUSSON, ERIC: Das Moor Roshultsmyren. Eine geologische, botanische und hydrologische Studie in einem südwestschwedischen Moor mit exzentrisch gewölbten Mooselementen [The bog Roshultsmyren. A geological, botanical, and hydrological study of a South-West-Swedish bog with excentrically raised moss elements]. — Lunds Univ. Årsskr., N. F., Avd. 2, 53: 12. Kungl. Fysiogr. Sällsk. Handl., N. F., 68: 12, 72 pp., 26 text-figs., 1 plate. Lund 1957. Also as Publ. fr. the Inst. of Min., Pal. and Quatern. Geol., Univ. of Lund, Sweden, 39.

OPPENHEIMER, H. R.: Wild emmer — its discovery by A. Aaronsohn, fifty years ago, and its importance for the origin of cultivated wheats. — SBT, 51, pp. 545—551, 1 text-fig. Uppsala 1957.

OTTERLIND, GUNNAR: Det svenska Söderhavet [The South Sea of Sweden]. — Natur i Blekinge, pp. 344—361, 12 text-figs. Uppsala 1957.

Popular account containing remarks on changes in salinity of the sea, and the occurrence of glacial relics in the fauna of the Baltic. *BL.*

PEJLER, BIRGER: Taxonomical and ecological studies on planktonic Rotatoria from Central Sweden. — KVA, Handl., Ser. IV, 6: 7, 52 pp., 5 text-figs., 1 plate. Uppsala 1957.

PEJLER, BIRGER: Taxonomical and ecological studies on planktonic Rotatoria from northern Swedish Lapland. — KVA, Handl., Ser. IV, 6: 5, 68 pp., 47 text-figs. Uppsala 1957.

PERSSON, HERMAN & GJAEREVOLL, OLAV: Bryophytes from the interior of Alaska. — Det Kgl. Norske Vid. Selsk. Skr., 1957: 5, 74 pp., 4 text-figs. Trondheim 1957.

PETTERSSON, BENGT: Växtligheten och människan i Gotlands fornlandskap [Vegetation and man in the ancient landscape of Gotland]. — Bygd och Natur. Tidskr. f. Hembygdsvård, 38, pp. 77—87, 6 text-figs. Malung 1957.

Popular account of Late- and Post-Glacial vegetation and prehistoric settlement on Gotland. *BL.*

PETTERSSON, EINAR: Om två hasselförekomster i Älvdalen [On two occurrences of hazel in Älvdalen]. — SBT, 50, pp. 197—210, 3 text-figs. Uppsala 1956.

Contains a map of the present and past distribution of hazel at its northern limit in Sweden. Two localities in the province of Dalecarlia are discussed with special regard to subsoil geology. *BL.*

RASMUSSON, GUNVOR: Floran i Månsarps socken [The flora in the parish of Månsarp]. — Tabergs Bergslag. Published by Tabergs Bergslags Hembygds-fören., 7, pp. 17—34, 11 text-figs. Smålands Taberg 1956.

The connection between bed-rock and vegetation is emphasized, and the eutrophic flora on basic rocks (Taberg, etc.) is specially dealt with. *WL.*

RIEDEL, WILLIAM R.: Radiolaria. A preliminary stratigraphy. — Göteborgs Kungl. Vet.- o. Vitt-Samh. Reports of the Swedish deep-sea expedition 1947—1948. Vol. VI. Sediment cores from the West Pacific. Fasc. III, pp. 59—96, 5 text-figs., 4 plates. Göteborg 1957.

RIEHM, HANS: En form av skravelsjuka hos mjölkkor i Schwarzwald, dess orsaker och botande [A form of deficiency disease (»Hinschkrankheit») in milk-cows in Schwarzwald, its causes and remedy]. — VnN, 12, pp. 4: 17—4: 20, 2 text-figs. Stockholm 1956.

The disease in question is due to cobalt deficiency. A direct connection was established between the occurrence of the disease and low percentages of cobalt in solid rock (granite with 0.7 p. p. m. Co), soil, and vegetation. Gneiss areas (8.4 p. p. m. Co) were free from the disease. *WL.*

RUNE, OLOF: De serpentinicola elementen i Fennoskandiens flora [The serpentinicolous elements in the flora of Fennoscandia]. — SBT, 51, pp. 43—105, 1 text-fig. English summary pp. 100—102. Uppsala 1957.

RUNE, OLOF: Serpentinfloran och dess växtgeografiska betydelse i Skandinavien [The serpentine flora and its phytogeographical significance in Scandinavia]. — BN, 109, p. 106. Lund 1956.

Brief review of a lecture held in 1955 in the Botanical Society of Lund. *WL.*

RUNE, OLOF: Studier över floran på serpentinbergarter i norra Fennoskandien och nordöstra Nordamerika [Studies on the flora of serpentine rocks in northern Fennoscandia and northeastern North America]. — 19 pp. English summary pp. 17—18. Uppsala 1957. Also as academical dissertation (Uppsala).

RUNE, OLOF: Vegetationstyper [Vegetation types]. — Fakta, 2, pp. 58—59, 3 text-figs. Norrköping 1956.

Brief survey of Swedish plant communities and their conditions of environment. *WL.*

RYDBERG, JEAN: »Bara ett gräs». En färd till »Stipa-kullen» i Vartofta-Åsaka [»Only a grass». An excursion to the »Stipa hill» in Vartofta-Åsaka]. — SN. Sv. Naturskyddsfören. Tidskr., 47, pp. 18—20, 1 text-fig. Uddevalla 1956.

Popular account of the vegetation at one of the three Swedish occurrences in Västergötland of *Stipa pennata*, a relict from the Post-Glacial climate optimum. *WL.*

RØNNING, OLAF I.: *Draba crassifolia* in Scandinavia. — Acta Borealia, A. Scientia, 11, 20 pp., 1 text-fig. Tromsø 1956.

SEGERSTRÅLE, SVEN G.: Baltic Sea. In Treatise on marine ecology and paleoecology. Vol. 1: Ecology. Edited by Joel W. Hedgpeth. — Geol. Soc. Amer., Mem. 67: 1, 751—800, 21 text-figs., 4 plates. Baltimore 1957.

SEGERSTRÅLE, SVEN G.: On the immigration of the glacial relicts of Northern Europe, with remarks on their prehistory. — Soc. Sci. Fenn., Comment. Biol., 16: 16, 117 pp., 39 text-figs. Helsingfors 1957.

SEGERSTRÅLE, SVEN G.: The distribution of Glacial relicts in Finland and adjacent Russian areas. — Soc. Sci. Fenn., Comment. Biol., 15: 18, 36 pp., 9 text-figs., 1 plate. Helsingfors 1956.

Also the Glacial relicts in the Gulf of Bothnia are taken into consideration. *WL.*

SELANDER, STEN: Skärgård och kust [Archipelago and coast]. — Natur i Västerbotten och Norrbotten, pp. 144—152, 7 text-figs., 1 plate. Uppsala 1956.

Popular account with remarks on the Quaternary history of some plants (esp. *Hippophaë rhamnoides*). *BL.*

SELLMAN, SVEN, SYRRIST, ARVID & GUSTAFSON, GÖSTA: Fluorine and dental health in southern Sweden. An epidemiological study. — Odont. Tidskr., 65, pp. 61—93, 7 text-figs. Göteborg 1957.

SITTLER, CLAUDE: Nouvelles palynologiques de France [Palynological news from France]. — GP, 1: 2, pp. 156—157. Uppsala 1956.

SJÖRS, HUGO: Nordisk växtgeografi [Scandinavian phytogeography]. — Scand. Univ. Books, 229 pp., 108 text-figs. Stockholm 1956.

In this textbook, particularly adapted to the university stage, chapters on the properties of the habitat, on the ecological soil science, and on the changes of vegetation and habitat since the Glacial period are also included. *WL.*

SKOTTSBERG, C.: Derivation of the flora and fauna of Juan Fernandez and Easter Island. — The Natural History of Juan Fernandez and Easter Island, 1, pp. 193—439, 1 plate. Uppsala 1956.

Snogerup, Sven: Bidrag till Skånes flora. 49. Flora och vegetation i Loshults socken [Contributions to the flora of Scania. 49. Flora and vegetation in the parish of Loshult]. — BN, 109, pp. 117—142, 11 text-figs. Also as Medd. fr. Lunds Botan. Mus., No. 112.

A brief description of solid rocks and soils in the area investigated is given. *WL.*

Sterner, Rikard: Landskapet och vegetationen [Landscape and vegetation]. — Torslanda. En sockenskildring, pp. 20—36, 14 text-figs. Lund 1956.

The morphology of the parish of Torslanda in its connection with the geological evolution, the occurrence of erratic boulders, shell-beds, and raised shore-lines as well as the relations of the vegetation to geology and morphology are dealt with. *WL.*

Sundin, Torsten: Floran i Billingssocknen Bolum [The flora of the Billingen parish of Bolum]. — SBT, 51, pp. 264—286, 1 text-fig. Uppsala 1957.

The author has studied the occurrence of various species of vascular plants in relation to the geological strata (dolerite, alum shale etc.), and gives a table of the distribution of eutrophic, mesotrophic, and oligotrophic forms. *BL.*

Suneson, Svante: Biologi. 4. Ärftlighets- och utvecklingslära för ring IV^4 och III^3 samt folkskoleseminarier [Biology. 4. Theory of heredity and evolution for the top classes IV^4 and III^3 and for training-colleges]. — Svenska Bokförl., 97 pp., 59 text-figs. Stockholm 1957.

Chapters on the paleontology and the theory of evolution pp. 72—73, on the support of phyto- and zoogeography for the theory of evolution pp. 78—80, and on the origin of man pp. 87—92. *WL.*

Svedmark, Bengt: Ny fyndort för alm i Åsele lappmark [New locality for elm in the Lapp territory of Åsele]. — Skogen, 44, p. 257, 2 text-figs. Stockholm 1957.

The new locality of relict *Ulmus* is the south-facing mountain of Handsktummen in the parish of Vilhelmina. The occurrence of black, lime-bearing shales at the foot of the mountain, in addition to the exposition, is obviously a favourable factor. *WL.*

Svedmark, Bengt: Ny fyndort för alm i Åsele lappmark [New locality for elm in the Lapp territory of Åsele]. — SBT, 51, pp. 346—350, 3 text-figs. Uppsala 1957.

Remarks on subsoil geology (See above). *BL.*

Säfverstam, Zander: Nya fynd av ask och hassel i norra Hälsingland [New finds of ash and hazel in Northern Hälsingland]. — BN, 110, pp. 124—126. Lund 1957.

The locality S. W. of Färsjö in the parish of Rogsta is the northernmost habitat known of wild-growing *Fraxinus* in Sweden. Shell-gravel here occurs. Four new localities of *Corylus* in the parish of Tuna are also mentioned. *WL.*

Sörlin, Anton: Om vegetationen på Seychellerna [On the vegetation of the Seychelles]. — SBT, 51, pp. 135—158, 9 text-figs. English summary pp. 156—157. Uppsala 1957.

Tatewaki, Misao: Geobotanical studies on the Kurile Islands. — Acta Hort. Gotoburg., 21, pp. 43—123, 14 plates. Göteborg 1957.

THOMASSON, KUNO: Reflections on arctic and alpine lakes. — Oikos, 7, pp. 117—143, 14 text-figs. Copenhagen 1956.

THORSLUND, PER: Mammutfynd i Lerdal, Rättvik [Find of mammoth in Lerdal, Rättvik]. — GFF, 79, pp. 249—250, 1 text-fig. English abstract p. 249. Stockholm 1957.

VALLIN, HERVID: Hallabäcken och dess närmaste omgivningar [Hallabäcken and its immediate surroundings]. — Skånes Natur, 43, pp. 85—95, 6 text-figs., 3 plates. Lund 1956.

In addition to a description of flora and fauna several notices are given on solid rocks and soils in the neighbourhood of the brook Hallabäcken, Söderåsen, Scania. *WL.*

WALDÉN, HENRIK W.: Hassel i Malung. Ett diskussionsinlägg [Hazel at Malung. A contribution to the discussion]. — SBT, 50, pp. 191—197, 5 text-figs. Uppsala 1956.

An outpost of hazel in the province of Dalecarlia is discussed with regard to climatic and edaphic factors. *BL.*

WALLDÉN, BERTIL: Västeråstraktens växt- och djurliv [Flora and fauna of the Västerås district]. — Västerås genom tiderna, 1, pp. 53—278, 98 text-figs., 2 plates. Västerås 1956.

In this rather detailed description of flora and fauna of the Västerås region a chapter on the Quaternary geological development is also included. *WL.*

WALLMAN, ÖRJAN: Växter och djur [Plants and animals]. — Hille vår hembygd, pp. 27—39, 6 text-figs. Gävle 1956.

A brief description of flora and fauna in the parish of Hille, Gästrikland, with notes on their connection with the geological development of the region. *WL.*

WEIMARCK, HENNING: Ravlundafältets natur [Nature of the Ravlunda field]. — Skånes Hembygdsförb. Årsb., 1957, pp. 10—20, 7 text-figs. Lund 1957.

Brief description of the vegetation types of the Ravlunda range in their dependence on physical conditions and earlier agricultural measures. *WL.*

WEINER, J. S.: Felande länkens mysterium [The mystery of the missing link]. — Wahlström & Widstrand, 180 pp. Stockholm 1956.

Deals in popular form with the unveiling of the alleged Piltdown find of primitive man. *WL.*

WETZEL, O.: Massenproduktion, Sedimentation und Fossilisation von Mikro-Organismen im Gebiet der Nord- und Ostsee, — ein Beitrag zur »Paläo-Planktontologie» Europas [Mass-production, sedimentation, and fossilization of micro-organisms in the North Sea and the Baltic — a contribution to the »paleoplanktonology» of Europe]. — XIV Int. Congr. of Zool., Copenhagen, 5.—12. August 1953, Proc., pp. 102—103. Disc. Poulsen, Wetzel, ibid., p. 103. Copenhagen 1956.

WIBECK, EDVARD: Stockholms skärgård, vårt största sportfiskeområde. Dess landskapliga natur och fågelliv [The archipelago of Stockholm, our largest fishing area. Its nature and bird life]. — Fiske, 1957, 19 pp., 8 text-figs. Örebro 1957.

Inter alia an account is given of the vegetation and bird zones of the archipelago. *WL.*

Wibeck, Edvard: Ur den småländska skogens historia [From the history of the forest in Småland]. — Värnamo Hembygdsfören. Årsb., 1956, pp. 3—15, 4 text-figs. Värnamo 1956.

As an introduction an account is given of the immigration history of the forest in South Sweden and the beech forest in the parish of Hånger is specially dealt with. *WL.*

SOIL SCIENCE AND AGROGEOLOGY

Agerberg, Lars S.: Brännbergsmyrens sättning [Settling of the Brännberg Bog]. — SJF, Medd. 77, 36 pp., 15 text-figs. English summary pp. 34—36. Stockholm 1956.

Agerberg, Lars S.: Contributions to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, pp. 141, 142. Uppsala 1957.

Experiences from the Brännberg State Experimental Farm show that there is a correlation between peat depth and extent of settling during the first years after the reclamation. Later on there will be a sinking connected with different cultivation methods. *EM.*

Agerberg, Lars S.: Erfarenheter från försök med olika fosforgödselmedel [Experiences from experiments with various phosphorous fertilizers]. — VnN, 13, pp. 4: 27—4: 29. Stockholm 1957.

Superphosphates in grain and powder form have been compared in more than 70 field tests during several years. *EM.*

Agerberg, Lars S.: Jordförstöring på myrjord [Soil destruction on organic soils]. — BVM, 9, pp. 79—80. Uppsala 1957.

Brief account of some recent papers on settling and removal of organic soils by cultivation. *WL.*

Agerberg, Lars S.: Jämförande försök med superfosfat och thomasfosfat [Comparative trials with superphosphate and Thomasphosphate]. — SJF, Medd. 85, 15 pp., 2 text-figs. English summary pp. 13—14. Stockholm 1957.

Agerberg, Lars S.: Superfosfat eller thomasfosfat. Resultat från en nyare undersökning [Superphosphate or Thomasphosphate. Results from a recent investigation]. — Norrbottens Lantmannablad 1957, pp. 116—117. Luleå 1957.

On soils poor in lime the Thomasphosphate has a somewhat better effect, on soils in a satisfactory lime state the superphosphate gives somewhat better results. *WL.*

Agerberg, Lars S.: Vilket är bäst: superfosfat eller thomasfosfat [Which is the best: superphosphate or Thomasphosphate]? — Västerbotten. Tidskr f. Västerbottens Läns Hushållningssällsk. och Skogsvårdsstyr., 30, pp. 131—132. Umeå 1957.

Thomasphosphate has somewhat better effect on soils fairly poor in lime, superphosphate, however, on soils in a more satisfactory lime state. *WL.*

ALVELID, SVEN: Kalknings- och gödslingsråd till markkarta i Uppsala län [Advice on liming and fertilizing to soil map in the county of Uppsala]. — VnN, 12: 5, pp. 33—34, 1 text-fig. Stockholm 1956.

Need of lime and other fertilizers on mineral soils and on organogenic soils in different conditions is stated. *WL.*

ALVELID, SVEN: Markkartering — en grundval för gödslingen [Soil mapping — a basis for the fertilizing]. — Försök och Forskn., 13, pp. 25—26. Stockholm 1956.

The significance of soil mapping and its value as a general orientation on the nutritional state of the soil are dealt with. *WL.*

ALVELID, S.: Mikroelement till sockerbetor. Försök med mangan och bor på Öland åren 1948—56 [Minor elements to sugar beets. Trials with manganese and boron on Öland in the years 1948—56]. — Kalmar läns södra Hushållningssällsk. Årsskr. för år 1957, pp. 37—42. Kalmar 1957.

The occurrence of manganese- and boron-deficiency on Öland is mentioned and fertilizing advice for its removal is given. *WL.*

ANDERSSON, ELISABETH: Om oxalatmetoder och deras användning vid markstudier [On oxalate methods and their application to soil studies]. — GFF, 78, pp. 552—557. English abstract p. 552. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 6.

ANDERSSON, SIGVARD: Contribution to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, p. 145. Uppsala 1957.

In Sweden there is hardly any reclamation of peat soils nowadays, but mires are drained in order to increase forest yield. The working out of principles common to Scandinavia-Finland when investigating peat and gyttja soils is not of current interest but it is desirable to know more about the theoretical background to the settling problems. *EM.*

ANDERSSON, SIGVARD: Fleråriga vallar och markstrukturen, några synpunkter [Grass fields of several years' duration and the soil structure, some comments]. — BVM, 9, pp. 26—28, 2 text-figs. Disc. Olofsson, Norrgård, Andersson, Cederström, Svensson, ibid., pp. 29—32. Uppsala 1957.

Brief account of a lecture given in the Swedish Pasture and Bog-Cultivation Association on the 13th of March, 1957. *WL.*

ANDERSSON, SIGVARD: Kapillära stighöjder och kapillära vattentransporter i mo- och mjälajordarter [Capillary heights of ascent and capillary water transport in mo and silt soils]. — NJF, 39, pp. 178—183. Disc. Löddesöl, Andersson, Dahl, ibid., pp. 183—187. Uppsala 1957.

An account of capillary investigations in laboratory specially directed on the problems of draining and water-storing in soils with single grain structure. The investigation methods are described. — Disc. (Andersson): Theoretically and with a reference to laboratory results, it is shown that soils for the main part consisting of particles finer than fine sand are very hard to drain, unless a stable macrostructure has developed. — (Dahl): The agreement between the theory of the capillary water flow and the results from methodical laboratory experiments is discussed as well as the practical importance of the capillary water movements for the plants. *EM.*

Andersson, Sigvard: Markfysikaliska undersökningar i odlad jord. X. Markfotot i färg och dess reproduktion [Physical investigations in cultivated soils. X. The soil photograph in colour and its reproduction]. — Grundförbättring, 9, pp. 55—64, 2 plates. English summary p. 110. Uppsala 1956.

Andersson, Sigvard: Markfysikaliska undersökningar i odlad jord. Allmän sammanfattning av delarna I—X [Physical investigations in cultivated soils. General summary of parts I—X]. — Grundförbättring, 9, pp. 65—71. English summary p. 110. Uppsala 1956. Also as academical dissertation (Uppsala).

Andersson, Sigvard: Några synpunkter på och reflektioner kring frågan om markfysik och bearbetning. Ett diskussionsinlägg [Some points of view and comments on the problem of soil physics and tillage. A contribution to the discussion]. — Grundförbättring, 10, pp. 1—6. English summary p. 86. Uppsala 1957.

Andersson, Sigvard: Vad betyder tjälen för jorden? [What does the soil frost imply for the soil?]. — Grundförbättring, 10, pp. 227—231. English summary p. 244. Uppsala 1957.

Anerud, K.: Bara en daggmask — Några ord om daggmaskarnas roll i jorden [Only an earth-worm — Some words on the role of earth-worms in the soil]. — VnN, 12, pp. 4: 31—4: 32, 1 text-fig. Stockholm 1956.

An investigation in Switzerland has shown that earth-worms from the lower to the upper horizons transport between 2.1 and 8.6 kg soil per m^2 and year. From Denmark there is a statement that the number of earth-worms may amount to 400 000 per ha. *EM.*

Anon.: Jordbrukets vattenproblem [The water problems of the farming]. — Traktorjourn., 1, pp. 10—11, 19, 2 text-figs. Stockholm 1956.

Summarizes the results of investigations about the water-holding capacity of the soils executed at the institution of agronomic hydrotechnics of the Ultuna College of Agriculture. *WL.*

Anon.: Riktlinjer för gödsling och kalkning [Directions for manuring and liming]. — Förl. Tidskr.-AB VnN, 88 pp., 54 text-figs., 1 plate. Göteborg 1957.

Instructions put together by GKS (Co-operation delegation of the fertilizer and lime industries) with the guidance of accounts of current problems on plant nutrients earlier printed in other publications. *WL.*

Anon.: Skogsodling på näringsfattig myrjord. Helt obetydlig tillförsel av mineralnäring kan ge storartade resultat [Forest-culture on bog soil poor in nutrients. A quite slight application of mineral nutrients may give magnificent results]. — BVM, 9, pp. 92, 102. Uppsala 1957.

Brief account of results of Norwegian trials according to a lecture by P. Thurmann-Moe at the annual meeting of the Norwegian Bog Association on the 6th of March, 1957. *WL.*

Arnborg, Tore: Untersuchungen über die Bodentemperatur in einer mittelschwedischen Baumschule [Investigations of the soil temperature in a Central Swedish tree-nursery]. — Allgem. Forstzeitschr., 11, pp. 101—105, 9 text-figs München 1956. Also as Medd. till Sällsk. f. prakt. Skogsförädling ledamöter, 79

ARRHENIUS, O.: Kemisk denudation i fjällregionen [Chemical denudation in the mountain region]. — GFF, 79, pp. 797—805, 2 text-figs. English abstract p. 797. Stockholm 1957.

ARRHENIUS, O.: Korrosion av stål i jord [Corrosion of steel in soil]. — TT, 86, pp. 171—172. Norrköping 1956.

Summary of a paper (Tekn. Skr., 159) aiming at a survey of the regional distribution in Sweden of some soil properties, such as resistivity and pH, and an investigation of the influence of these properties on the corrosion of steel. *WL.*

ARRHENIUS, O.: Plant-food from decayed leaves and conifer needles. — Acta Agr. Scand., 7, pp. 321—340, 7 text-figs. Uppsala 1957.

ARRHENIUS, O.: The corrosion of steel in soil. — Tekn. Skr. utg. av Sv. Teknologfören., 159, 19 pp., 7 text-figs., 1 plate. Stockholm 1956.

ASLYNG, H. C.: Soil organic matter: Oxidation value and carbon content. — Acta Agr. Scand., 6, pp. 64—80, 2 text-figs. Uppsala 1956.

ASLYNG, H. C.: Vandbevægelse i jorden over grundvandet [Water movements in unsaturated soil]. — Grundförbättring, 9, pp. 72—89, 7 text-figs. English summary pp. 88—89. Uppsala 1956.

BENGTSSON, GEORG & KNUTSSON, GUNNAR: Ökad kännedom om jorden önskvärd. Markkarteringen kan kompletteras med djupprov [Increased knowledge of the soil is desirable. Soil-mapping may be completed with deep soil samples]. — LSL, 40 (67), pp. 431—432, 1 text-fig. Stockholm 1956.

The variations of the amount of plant nutrients in deep soil profiles (1 m) are preliminarily illustrated by results of analyses from three profiles as regards phosphorus, potassium, minor elements, pH etc. *HM.*

BENGTSSON, NILS G.: Myrjordarna i forskning och försök. II [The peat soils in research and experiments. II]. — LSL, 40 (67), p. 816. Stockholm 1956.

A contribution in connection with Lengdén's proposal to increase the activity of research and experiments on the cultivation of peat soils. The author establishes that in Sweden this cultivation has been neglected in research, experimentation, education, and information. *HM.*

BENGTSSON, NILS & KARLSSON, NILS: Om bestämning av ammoniak och salpeter i jord vid närvaro av cyanamid, urinämne och dicyandiamid [On the determination of ammonia and nitre in soil in the presence of cyanamide, urea, and dicyandiamide]. — Stat. Lantbrukskem. Kontrollanst., Medd. 18, pp. 18—20. Stockholm 1957.

On the conditions stated the ammonia nitrogen may be recovered with an error of ± 3 % by distillation with MgO. The determination of the saltpeter nitrogen by a new distillation with Devarda's alloy is uncertain. The phenol disulphonic acid method gives, however, good results. *WL.*

BERGFELT, ALLAN: Undersökning av korrosionsrisker i lera [Investigation of corrosion risks in clay]. — Statens Nämnd för Byggnadsforskn., Handl., 28, 57 pp., 31 text-figs. English summary pp. 51—56. Norrköping 1957.

BERGFELT, ALLAN: Undersökning av rostrisker i lera [Investigation of rust risks in clay]. — Sv. Komm.-Tekn. Fören. Handl. 1955: 15, 15 pp., 14 text-figs. Stockholm 1956.

Investigations in the Gothenburg district show that the formation of rust on iron structures in clay is rather slight. Diagrams of chemical and physical properties of the clay in relation to the depth under the surface are given. *WL.*

BERGLUND, GÖSTA: Tubulering. Resultat av svenska tubuleringsförsök utförda under åren 1948—56 [Mole drainage. Results of Swedish mole drainage experiments executed during the years 1948—56]. — Grundförbättring, 9, pp. 154—176, 227—257, 23 text-figs. English summary pp. 178, 258. Uppsala 1956.

BERNELL, L.: The properties of moraines. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, 2, pp. 286—290, 10 text-figs. French summary p. 286. London 1957.

BJÄLFVE, G.: The nitrification of calcium cyanamide and its effect on the soil microflora. — KLA, 23, pp. 423—456. Swedish summary pp. 452—455. Uppsala 1957.

BJÖRKLUND, C. M.: Gödslings- och kalkningsråd till markkarta i Kristianstads län [Fertilizing and liming advice to soil map in the county of Kristianstad]. — VnN, 12: 5, pp. 26—27. Stockholm 1956.

Suitable applications of P, K, N, and Ca for different soils and crops are recommended. *WL.*

BJÖRKLUND, CARL M.: Något om Kristianstads läns jordbruk [A few notes on the farming in the county of Kristianstad]. — Lantbrukstjänstemannen, 39, pp. 93, 125—127, 1 portrait. Stockholm 1957.

The soil types of the county and their nutritional state are dealt with. *WL.*

BOKEN, ELSE: Bestemmelse af jordens tilgængelige manganmængde [Determination of the amount of available manganese in soils]. — NJF, 38, pp. 229—232, 1 text-fig. Uppsala 1956.

Steenbjerg's and Heintze's methods for the determination of available manganese gave on comparison different results in different soils. The first-mentioned method gives higher values in clay and lower in sand. Heintze's method is recommended for practical work because it is faster and cheaper and requires smaller samples. *EM.*

BURSTRÖM, HANS: Mineralstoffwechsel [Mineral metabolism]. — Fortschr. der Botan., 18, pp. 242—263. Giessen 1956.

BURSTRÖM, HANS: Mineralstoffwechsel [Mineral metabolism]. — Fortschr. der Botan., 19, pp. 221—234. Giessen 1957.

CARLSON, HELGE: Markkarteringsverksamheten i länet [The soil-mapping activity in the county]. — Tidskr. f. Hushållningssällsk. och Skogsvårdsstyr. i Gävleborgs län 1957, p. 68. Gävle 1957.

The soil analyses show that the phosphate, potassium, and lime state of the soils is somewhat better in Gästrikland than in Hälsingland. *WL.*

COLLINI, BENGT: Metoder för undersökning av fastmarksjordars mineralogiska sammansättning [Methods for investigation of the mineralogical composition of mineral soils]. — NJF, 38, pp. 299—300. Uppsala 1956.

At the Institute of Soil Science in Uppsala both direct and indirect methods are used. Of the former polarisation microscopy is mentioned whilst the latter include X-ray and differential thermal analysis. *EM.*

COLLINI, BENGT: On the origin and formation of the Fennoscandian Quaternary clays. — GFF, 78, pp. 528—535. Disc. Tamm, Hagerman, Asklund, Collini, Wiklander, Byström, ibid., pp. 535—536. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 6.

DAHL, N. J.: Contributions to discussion after lectures by Pentti Kaitera, Aasulv Loddesol, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, pp. 143—144. Uppsala 1957.

In Denmark there are hardly any unreclaimed mires of such thickness that settling is to be feared except where draining and reclamation of mud areas from the sea are planned. Geotechnical investigations of these soils are expected to give possibilities of determining the size and velocity of the settling. *EM.*

DEBYSER, J.: Contribution à l'étude des sédiments organiques de la Mer Baltique. Relation entre le pH, le Eh et la diagénèse [Contribution to the study of the organic sediments of the Baltic. Relation between pH, Eh, and the diagenesis]. — Rev. Inst. Franç. du Pétrole, 12, pp. 3—13, 7 text-figs. English and Spanish summaries p. 3. Paris 1957.

DEBYSER, JACQUES: Études de sédiments organiques de la Mer Baltique (Déscription et problèmes de diagénèse) [Studies of organic sediments of the Baltic (Description and problems of the diagenesis)]. — XX Congr. Geol. Int. Resumenes de los trabajos presentados, pp. 261—262. Mexico 1956.

DRAKE, H.: Markkarteringen och dess betydelse [The soil mapping and its significance]. — Jönköpings Läns Hushållningssällsk. Tidskr., 1956: 4, pp. 3—4. Jönköping 1956.

The signification of soil mapping and its use for the regulation of liming and fertilizing are emphasized. *WL.*

EGNÉR, H.: Die Bedeutung der Nährstoffzufuhr durch Luft und Niederschläge für die Bodenfruchtbarkeit [The significance of application of nutrients through air and precipitation for the fertility of the soil]. — Landwirtschaftl. Forschung, Sonderh. 7, pp. 90—94. Frankfurt am Main 1956.

EGNÉR, HANS: Necessary requirements of methods suitable for mass soil analysis. — OEEC, Project N:o 156 (The organisation and rationalisation of soil analysis), pp. 193—199. Paris 1956.

EGNÉR, H.: Synpunkter på kaliumanalys för markkartering [Aspects on potassium analysis for soil mapping]. — NJF, 38, pp. 301—302. Disc. Semb, Egnér, Norrgård, Jansson, ibid., pp. 302—303. Uppsala 1956.

For the supply of potassium to plants the subsoil may be of greater importance than earlier believed. In addition the supply of potassium via the atmosphere from certain industries (*e. g.* cement-works) and from the sea ought to be taken into account when interpreting field experiments. — Disc. (Semb): Investigations in Norway show that not only clay soils but also sandy till or sand may contain great reserves of potassium. Determinations of exchangeable potassium only do not give information enough of the potassium state of the soil. — (Norrgård): At soil mapping it is important to take into consideration the reserves of potassium in the soil. — (Jansson): There is a correlation between the potassium and ammonium fixation and therefore the possibility of estimating the fixation of potassium in a soil by the determination of its ammonium fixation is well worth to investigate. *EM.*

Eklundh, Bertil: Några aktuella synpunkter på växtodlingen [Some current aspects on farming]. — Lantbrukstjänstemannen, 38, pp. 95—99, 123—125, 1 portrait. Stockholm 1956.

The soil destruction, the humus problem, the cultivation of the soil, and the ferti-izing are discussed. *WL.*

Eklundh, Bertil: Några synpunkter på aktuella jordbruksfrågor [Some comments to current agricultural problems]. — Lantbruksveckan 1956, pp. 33—42. Linköping 1956.

The soil erosion, the humus problem, the soil cultivation, the fertilizing etc. are briefly dealt with. *WL.*

Ekman, Per & Lundblad, Karl: Kalkningsförsöken i Sverige [The liming trials in Sweden]. — Jord-Gröda-Djur, 12, pp. 63—69. Stockholm (1955) 1956.

The results, as far as Sweden is concerned, of a survey of liming trials executed in the Scandinavian countries are briefly reported and the need of continued liming investigations is emphasized. *WL.*

Elmers, G.: Fosfatgödsling och sockerbetsskörd [Phosphate application and yield of sugar beets]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 23, pp. 94—96. Malmö 1957.

The influence of different quantities of superphosphate, totally and during differen periods of years, on the yield of sugar beets as well as the dependence of the effec on pH and phosphate state of the soil are described according to a great number o trials. *WL.*

Elmers, Gösta: Jordens och gödslingens inverkan på betornas sockerhal och sockerskörd [Influence of soil and fertilizing on the sugar content an yield of sugar beets]. — Sv. Betodl. Centralfören. Tidskr., 19, pp. 10—16 1 text-fig. Malmö 1956.

According to the sugar-beet trials in Scania the sugar content is highly dependen on clay content, pH, and phosphate class of the soil, the sugar yield is very strongl influenced by the phosphate class, but also by clay content and pH. These difference at normal fertilizing between different soils seem to be greater than those change which are obtainable by increased or reduced fertilizing. *WL.*

Elmers, Gösta: Jordens och gödslingens inverkan på betornas sockerhal och sockerskörden [Influence of soil and fertilizing on the sugar content an yield of sugar beets]. — LSL, 40 (67), pp. 238—239, 1 text-fig. Stockholm 195

Results of about 5 000 fertilizing trials in Scania. High clay content, high pH, an a high phosphate class increase the sugar content. The yields are greatest on ligh and intermediate clays deficient in humus. Supply of nitrogen reduces the sugar conten but increases the yield and has the best effect at low pH-values and with high p tassium contents. Supply of potassium has only a slight effect. *HM.*

Elmers, Gösta: Några faktorers inverkan på betornas sockerhalt [Influence of some factors on the sugar content of the beets]. — Sv. Betodl. Centralfören. Tidskr., 20, pp. 23—24. Malmö 1957.

Among other things the influence of the soil, its clay-, humus-, and phosphate-content as well as pH is dealt with. *WL.*

Elmers, Gösta & Gesslein, Sven: Inverkan av olika faktorer på kvävegödslingens effekt i sockerbetor [Influence of different factors on the effect of the nitrogen application in sugar beets]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 23, pp. 26—32. Malmö 1957.

The effect of nitrogen application decreases with increasing humus content of the soil and seems to be greater in soils with higher clay content. At lower pH values the need of nitrogen increases and better nitrogen effect is attained when the phosphate state is satisfactory. *WL.*

Enge, Gunnar: Markkartering och fältförsök är grunden för hushållningssällskapets växtodlingsrådgivning [Soil mapping and field trials are the basis of the farming advice of the rural-economy association]. — Kalmar läns norra Hushållningssällsk. Kvartalsskr., 16, pp. 78—81, 2 text-figs. Västervik 1956.

Deals with the trial activity and soil mapping, prosecuted by the rural-economy associations, and the interaction between them. *WL.*

Ericsson, Gösta: Förklaringar till markkartan i Skaraborgs län [Explanations to the soil map in the county of Skaraborg]. — VnN, 12: 5, pp. 27—29. Stockholm 1956.

The need of lime, phosphate, and potassium of the soils is dealt with. *WL.*

Eriksson, Erik N.: Hur ska vi gödsla i år [How is the fertilizing to be done this year]? — Västernorrlands Lantmannatidn. 1957, pp. 39—41. Härnösand 1957.

The need of application of phosphate, potassium, nitrogen, and composite fertilizers of different soils is dealt with. *WL.*

Eriksson, Janne: Dräneringen och bärkraften i åkermark [The drainage and bearing strength of cultivated soil]. — Jord-Gröda-Djur, 13, pp. 33—46, 11 text-figs., 1 portrait. Stockholm 1956 (1957).

The bearing strength of the surface layers of the soil is illustrated from different aspects, such as strain and deformation under wheel loads, influence of water on the bearing strength of different materials, and bearing strength of different soil types. Finally, the dependence of the bearing strength on precipitation is discussed. *WL.*

Eriksson, Janne: Från Kulturtekniska sektionens förhandlingar under NJF:s Stockholmskongress 1956 [From the proceedings of the section of Soil Technology during the meeting in Stockholm of the Scandinavian Society of Agricultural Research in 1956]. — Grundförbättring, 9, pp. 196—205, 4 text-figs. English summary p. 258. Uppsala 1956.

Fiedler, H. J.: Untersuchungen über Bodenstrukturverbesserungsmittel. III. Qualitative Untersuchungen über den Abbau von Carboxymethylzellulosen durch Bodenmikroorganismen [Investigations of soil conditioners. III. Qualitative investigations of the decomposition of carboxymethylcellulose by soil microorganisms]. — KLA, 23, pp. 367—373. Uppsala 1957.

Fiedler, H. J. & Torstensson, G.: Untersuchungen über Bodenstrukturverbesserungsmittel. II. Über die Beeinflussung physikalischer Bodeneigenschaften durch Carboxymethylzellulosen [Investigations of soil conditioners. II. On the effect of carboxymethylcellulose on physical properties of soils]. — KLA, 23, pp. 342—366, 5 text-figs. Uppsala 1957.

Flodkvist, Herman: Contribution to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, pp. 142—143. Uppsala 1957.

In mud-clay soils the causes of settling are different from those in peat and gyttja soils. The water is there physically bound but may disappear by evaporation, when the volume diminishes and permanent, vertical cracks are formed. Settling by draining the ground water takes place rapidly and is finished after 2—3 years. The effect of oxidation in peat soil is dependent on its use. No or an unimportant settling arises if the ground is used for permanent grazing. *EM.*

Franck, O.: Aktuellt om växtnäringstillförsel [Problems of current interest concerning the application of plant nutrients]. — Gödslingens planläggning inför 1957, pp. 24—32. Stockholm 1956.

Information and advice as to liming and application of stable-dung, phosphorus, potassium, and nitrogen fertilizers in dependence on the nutrient state of the soil, etc. *WL.*

Franck, O.: All växtnäringstillförsel måste göras skiftesindividuell [All application of plant nutrients must be done field-individual]. — HV, 5, pp. 34—38, 9 text-figs. Stockholm 1956.

It is emphasized that the nutritional conditions of the soils and consequently their need of fertilizers often vary within short distances. *WL.*

Franck, O.: Jämförande försök med superfosfat, »hyperfosfat Reno» och smältfosfat [Comparative trials with superphosphate, »hyperphosphate Reno», and a fused phosphate]. — SJF, Medd. 79, 17 pp., 2 text-figs. English summary pp. 16—17. Stockholm 1957.

Franck, O.: Kalk och fosforgödslings inflytande på skördeavkastning och markbördighet vid olika jordmånsförhållanden [The influence of lime and phosphate fertilizers on crop production and soil fertility under different soil conditions]. — SJF, Medd. 71—75, pp. 5—31, 7 text-figs., 1 plate. English summary pp. 29—31. Stockholm 1956.

Franck, O.: Tillförsel av växtnäring måste planeras på lång sikt [Application of plant nutrients must be planned at long sight]. — HV, 4, pp. 1—2. Stockholm 1956.

Some general points of view on the application of plant nutrients to the soil. The importance of soil-mapping is emphasized. *WL.*

Franck, O.: Vägledning om tillförsel av växtnäring [Guide to the application of plant nutrients]. — HV, 4, pp. 3—14, 18 text-figs. Stockholm 1956.

Deals with the experimental activity and the soil-chemical analysis (soil-mapping) as means of assistance for determining the need of fertilizing. *WL.*

Franck, O.: Växtnäringstillförsel på fastmarksjord [Application of plant nutrients on mineral soils]. — HV, 4, pp. 15—77, 38 text-figs. Stockholm 1956.

Deals with lime and liming, manure and the various artificial fertilizers, separately or combined, in their effect upon the nutritional state of the mineral soils. *WL.*

Fredén, Sven: Några undersökningar över snabbmetoder för bestämning av lerors flytgräns [Some investigations into rapid methods of determining the liquid limit of clays]. — GFF, 78, pp. 143—155, 8 text-figs. English abstract p. 143. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 5.

Fredriksson, Lars: Aktuella fosforfrågor [Current phosphorus problems]. — Gödslingens planläggning inför 1957, pp. 34—38, 2 text-figs. Stockholm 1956.

The appropriate performance of the phosphate manuring at different lime- and phosphate-conditions of the soil is dealt with. *WL.*

Fredriksson, Lars: Aktuella kaliumfrågor [Current potassium problems]. — Gödslingens planläggning inför 1957, pp. 39—46, 4 text-figs. Stockholm 1956.

The potassium balance of the soil and directions how to maintain the potassium content are dealt with. *WL.*

Fredriksson, Lars: Aktuelle Phosphatfragen [Current phosphate problems]. — Die Phosphorsäure, 17, pp. 77—81, 1 text-fig. Essen 1957.

Fredriksson, Lars: De sammansatta gödselmedlen [The composite fertilizers]. — Försök och Forskning, 13, pp. 26—28. Stockholm 1956.

The content of plant nutrients of the composite fertilizers as well as the pros and cons of their use are discussed. *WL.*

Fredriksson, Lars: Fosfatgödslingsproblem [Problems of application of phosphate fertilizers]. — Jord-Gröda-Djur, 13, pp. 49—62, 7 text-figs., 1 portrait. Stockholm 1956 (1957).

The phosphorus content of Swedish cultivated soils is illustrated by a number of soil profiles from different parts of the country. The occurrence of phosphorus in the soil and the need of application of phosphates as well as the connection between phosphate condition of the soil, intensity of the phosphate application, and phosphorus content and quality of the crop are dealt with. *WL.*

Fredriksson, Lars: Fosfat- och kaligödslingsfrågor [Questions concerning application of phosphate and potassium fertilizers]. — Hushållningssällskapens Tidskr., 24, pp. 27—28, 1 text-fig. Stockholm 1957.

The problems of plant nutrients ought to be seen at long sight and so the goal must be to build up a soil which from physical as well as chemical points of view forms a favourable basis for the cultivated plants. The interpretation of field experiments with phosphate and potassium fertilizing is discussed. *EM.*

Fredriksson, Lars: Inför vårens gödsling [On spring manuring]. — LSL, 41 (68), pp. 233—235, 2 text-figs. Stockholm 1957.

General aspects on the need of various soils for nutrients, the use of soil maps and investigation results to determine the need for nutrients, and points of view on the use of single and compound fertilizers are discussed. *HM.*

Fredriksson, Lars: Kaliumgödsling [Application of potassium fertilizers]. — Jord-Gröda-Djur, 14, pp. 61—80, 19 text-figs., 1 portrait. Stockholm 1957 (1958). Also as Stat. Jordbruksförs., Särtr. o. småskr., 101.

The total content of potassium varies considerably, in mineral soils it is about 2—3 % and in peat soils some hundredths to some tenths of one per cent. As plant nutrition the potassium dissolved in the soil liquid is immediately available, the potassium adsorbed to the soil particles after ionic exchange. Potassium bound to crystal lattices, however, is practically unavailable to the plants. An investigation of soil profiles carried out by the author shows that clay soils have great reserves of potassium and that potassium fertilizing of such soils may be looked upon only as a maintenance measure. The content of potassium in clays may differ. The Scanian clays are always more deficient in potassium than the clays of Western and Central Sweden. The necessity of application of potassium is illustrated by examples. *EM.*

Fredriksson, Lars: Ny undersökning över växtnäringsförhållandena i svenska åkermarksprofiler [A recent investigation of plant nutrition conditions in Swedish cultivated soil profiles]. — VnN, 12, pp. 2: 16—2: 25, 6 text-figs. Stockholm 1956. Also as Stat. Jordbruksförs., Särtr. o. småskr., 92.

Studies of profiles in cultivated soils have been carried out in about 200 places in Sweden concerning the soil formation and the distribution of plant nutrients. There are often important differences in the content of nutrients between the surface-soil and the sub-soil. Usually the content is lowest immediately below the depth of ploughing. *EM.*

Fredriksson, Lars: Några data rörande växtnäringsämnenas fördelning i markprofilen i en skånsk betesmark [Some data concerning the distribution of plant nutrients in the soil profile of a Scanian pasture]. — BVM, 8, pp. 141—144. Uppsala 1956.

A pasture-ground profile from the farm Skarhult, Kungshult, county of Malmöhus, presents to a depth of 30 cm a great lime deficiency, whereas the phosphate- and potassium-percentages are high in the very surface layers, the upper parts of the subsoil, however, being impoverished of these plant nutrients. *WL.*

Fredriksson, Lars: Sammansatta gödselmedel [Composite fertilizers]. — Norrbottens Lantmannablad, 1956, pp. 54—55. Luleå 1956.

The pros and cons of using composite fertilizers are discussed and some directions for their application are given. *WL.*

Fredriksson, Lars: Växtnäringstillförselns inverkan på markens bördighet belyst med nyare undersökningsresultat [Influence of application of plant nutrients on soil fertility as illustrated by recent investigation results]. — VnN, 13, pp. 3: 1—3: 17, 21 text-figs. Stockholm 1957. Also as Stat. Jordbruksförs., Särtr. o småskr., 99.

The soil fertility is due to many factors, among other things the supply of air, water, and nutritive salts. According to recent comprehensive investigations naturally fertile soils are characterized by high contents of lime and easily soluble nutritive salts and in most cases considerable reserves of nutrients. In soils extremely poor in lime and phosphate an improvement of the soil conditions may manifold the crop yields. *EM.*

Fredriksson, Lars: Växtnäringstillförselns inverkan på markens bördighet belyst med nya undersökningsresultat [Influence of application of plant nutrients on the fertility of the soil as illustrated by new investigation results]. — VnN, 12: 5, pp. 44—48, 3 text-figs. Stockholm 1956.

Brief summary of a lecture illustrated by two soil profiles from Västergötland and Scania, respectively. *WL.*

FREDRIKSSON, LARS: Växtnäringsämnenas fördelning i några åkermarksprofiler från Östergötlands län [The distribution of plant nutrients in some soil profiles from the county of Östergötland]. — Östgöta-Lantmännens Centralfören. Årsb., 18, pp. 31—42, 6 text-figs., 1 portrait. Norrköping 1957.

Five profiles of cultivated soils from different parts of Östergötland, stating the distribution of Mg, Ca, P, and K as well as loss of ignition, particle-size distribution, and pH, are reported and discussed. *WL.*

GANDAHL, RUNE: Bestämning av tjälgräns i mark med enkel typ av tjälgränsmätare [Determination of frost depth in the ground with a simple type of measuring device]. — Grundförbättring, 10, pp. 7—19, 5 text-figs. English summary p. 86. Uppsala 1957. Also as Stat. Väginst., Stockholm, Rapport 30.

GANDAHL, R.: Tjälgränsmätare [Apparatus for measuring frost depth]. — Sv. Vägfören. Tidskr., 43, p. 63, 1 text-fig. Norrtälje 1956.

The author has constructed an apparatus for measuring frost depth in the ground. It consists of a plastic tube with an indicator fluid, distilled water coloured with methylene blue. When the tube is sunk into the frozen ground the water is also frozen down to the frost depth and is discoloured. The apparatus has been employed with good results. *EM.*

GANDAHL, R. & BERGAU, W.: Two methods for measuring the frozen zone in soil. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, 1, pp. 32—34, 4 text-figs. French summary p. 32. London 1957.

GRÉEN, SVEN: Jord och jordförbättring [Soil and soil-improvement]. — Stora Trädgårdsboken, Natur och Kultur, pp. 41—52, 22 text-figs. Stockholm 1957.

Description of the most common soils and their improvement through liming and fertilizing with special regard to gardening. *WL.*

GUNNARSSON, OLLE: Några synpunkter på s. k. »fullgödselmedel» [Some aspects of the so-called »complete fertilizers»]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 23, pp. 144—149. Malmö 1957.

The pros and cons at the use of composite fertilizers in Swedish farming are discussed. *WL.*

GUNNARSSON, OLLE: Sammansatta gödselmedel [Composite fertilizers]. — Västernorrlands Lantmannatidn. 1957, pp. 110—112. Härnösand 1957.

The composite fertilizers, advantages and disadvantages of their use are discussed. *WL.*

GUNNARSSON, OLLE: Sammansatta gödselmedel — s. k. »fullgödselmedel». Några synpunkter på ett aktuellt problemkomplex för växtnäringsforskningen [Compound fertilizers — so-called »complete fertilizers». Some aspects to a complex of problems of current interest for the investigation of plant nutrients]. — VnN, 13, pp. 2: 10—2: 17, 2 text-figs. Stockholm 1957.

Mixed fertilizers have occurred since a long time but now there are also complex fertilizers with two or three important plant nutrients in the same chemical compound. Their effect compared with that of single fertilizers has, however, not yet been demonstrated by experiments. *EM.*

Gustafsson, Henry: Markkartering ett värdefullt hjälpmedel för det moderna jordbruket [Soil mapping an aid of value for the modern farming]. — VnN, 12: 5, pp. 1—11. Stockholm 1956.

The extent of soil mapping in Sweden together with some results concerning the lime, phosphate, potassium, and minor-element state of the soil is dealt with. *WL.*

Gustafsson, Yngve: Contributions to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, pp. 144—145. Uppsala 1957.

Comparisons of results from earlier investigations in Scandinavia-Finland as to settling in organic soils would be of great value for a survey of what has been done concerning these problems. *EM.*

Haardt, M. & v. Buch, M. W.: Die Standortskartierung im forstlichen Betrieb. Bedeutung und Zweck sowie Durchführung einer Standortskartierung [Site mapping in the forestry enterprise. Significance and purpose as well a performance of a site mapping]. — SST, 54, pp. 23—34, 5 text-figs. English summary pp. 33—34. Swedish summary p. 34. Norrtälje 1956.

Haeggblom, Einar: Mörebygdens jordbruk [The farming of the Möre district]. — Lantbrukstjänstemannen, 38, pp. 197—199, 213, 4 text-figs. Stockholm 1956.

As a background to a description of the farming in the Kalmar region a brief accoun is given of the geology of the area, especially its soils. *WL.*

Hagman, J. V.: Markkartor och rådgivning om gödsling och kalkning Stockholms län [Soil maps and advice on fertilizing and liming in the county of Stockholm]. — VnN, 12: 5, pp. 30—32. Stockholm 1956.

Advice on appropriate application of phosphorus, potassium, nitrogen, and lim to mineral- and organic soils is given. *WL.*

Halden, Bertil E.: Skogsmarken [The forest soil]. — Handledning skogshushållning [A guide to forestry]. Published by Norrlands Skogsvårds förbund. Fifth edition, pp. 15—62, 11 text-figs. Stockholm 1957.

An account of the chemical composition of rocks, of soil formation and its chemica and physical importance in forestry in connection with edafic conditions such a moisture, temperature, and humus formation as well as soil management. *EM.*

Hallerfors, M.: Skaraborgs län som jordbrukslän [The county of Skara borg as an agricultural district]. — Lantbrukstjänstemannen, 38, pp. 271— 273, 312, 4 text-figs. Stockholm 1956.

The soil conditions and climate of the county are dealt with as the basis of th farming. *WL.*

Hallgren, Gunnar: Contribution to discussion after lectures by Pentti Kaitera, Aasulv Loddesol, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, p. 141. Uppsala 1957.

Investigations of the mire Gisselåsmyren have shown that the settling of the mire after the reclamation has strikingly decreased. During the first 10 years it was 3 cm a year but during the following 10 years only 0.5 cm a year. *EM.*

Hallin, Sven: Contribution to discussion after lectures by Pentti Kaitera, Aasulv Loddesol, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, p. 144. Uppsala 1957.

Methods and intensity of cultivation are of great importance for the settling of mud soils. *EM.*

Hansbo, Sven: A new approach to determination of the shear strength of clay by the fall-cone test. — Royal Swedish Geotechn. Inst. Proc., No. 14, 47 pp., 32 text-figs., 1 plate. Stockholm 1957.

Ingestad, Torsten: Studies on the nutrition of forest tree seedlings. I. Mineral nutrition of birch. — Physiol. Plant., 10, pp. 418—439, 2 text-figs. Lund 1957.

Ingvar-Nilsson, Sven: Kvävegödselmedlens inflytande på matjordens reaktionstal samt variationer i detta under vegetationsperioden [Influence of nitrogen fertilizers on the reaction of the top-soil and its variations during the vegetation period]. — VnN, 13, pp. 2: 29—2: 32, 2 text-figs. Stockholm 1957.

Different nitrogen fertilizers cause differences in pH-values which locally may amount to one or several units. *EM.*

Jakobson, B.: Some fundamental properties of sand. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, 1, pp. 167—171, 6 text-figs. French summary p. 167. London 1957.

Jansson, Sven L.: Det kreaturslösa jordbruket och markbördigheten [Animal-ree farming and soil fertility]. — Jord-Gröda-Djur, 14, pp. 53—60, 1 portrait. Stockholm 1957 (1958).

Attention is called to the fact that a result of the modern animal-free farming may be a rapid consumption of the organic components of the top-soil. The importance of an effective soil conservation is emphasized. *WL.*

Jansson, Sven L.: Forskningsuppgifter kring det kreaturslösa jordbruket. Frågor rörande markbördighet och markvård [Research problems in animal-ree farming. Questions concerning soil fertility and soil conservation]. — NJF, 39, pp. 428—431. Uppsala 1957.

An investigation of soil conservation, which is made necessary by the change into animal-free farming, is outlined. *EM.*

Jansson, Sven L.: Humusvård [Humus conservation]. — HV, 3, pp. 19—35, 3 text-figs. Stockholm 1956.

Deals with the connection between the organic soil substance and the cultivation properties of the soil, the influence of cultivation on type and amount of humus, and practical measures for an appropriate regulation of the biological processes in the soil. *WL.*

Jansson, Sven L.: Kalkfrågan ur markvårdssynpunkt [The question of liming in soil conservation]. — VnN, 12, pp. 3: 1—3: 5, 2 text-figs. Stockholm 1956.

The author considers that the rationalizing efforts in modern farming too much are done at the expense of liming. Liming experiments carried out till now have in general been of short duration and the importance of lime in soil conservation is not sufficiently investigated. *EM.*

Jansson, Sven L.: Kalkning [Liming]. — HV, 3, pp. 1—18, 8 text-figs. Stockholm 1956.

Deals with the chemical conditions in the soil, particularly the lime state, the lime requirements of the Swedish soils and their determination as well as different sorts of lime and the performance of liming. *WL.*

Jansson, Sven L.: Kulturväxternas näringsbehov [The need of nutrients of cultivated plants]. — HV, 2, pp. 10—19, 3 text-figs. Stockholm 1956.

The mineral substances found in plants, the need of the crops of individual nutrients, and the most typical signs of deficiency are dealt with. *WL.*

Jansson, Sven L.: Kvävegödsling är alltid aktuell på våren [Nitrogen fertilizing always is actual in spring]. — LSL, 40 (67), pp. 212—216, 1 text-fig. Stockholm 1956.

A general account of the nitrogen transformations in soils. *HM.*

Jansson, Sven L.: Marken som växtplats. Nödvändigheten av växtnäringstillförsel och markvård [The soil as habitat of plants. The necessity of supply of plant nutrients and of soil conservation]. — HV, 2, pp. 1—9, 2 text-figs Stockholm 1956.

Brief account of the chief outlines of soil formation, different types of soils, and influence of cultivation on soil formation. *WL.*

Jansson, Sven L.: Om det organiska markkvävets uppbyggnad och nedbrytning [On the formation and decomposition of organic nitrogen in the soil]. — NJF, 38, pp. 245—256, 1 text-fig. Uppsala 1956.

An account of laboratory experiments with heavy nitrogen, N^{15}, for the study o the extent of the nitrogen transformations with respect to formation and mineralization of organic matter in soil. *EM.*

Jansson, Sven L.: Om kalkens verkan i jorden [On the effect of lime in the soil]. — Östgöta-Lantmännens Centralfören. Årsb., 17, pp. 13—23, 2 text-figs., 1 portrait. Norrköping 1956.

The soil has its optimum lime state when 2/3—3/4 of the colloids are saturated with calcium. The pH value then is 6.5. *WL.*

Jansson, Sven L.: Om markförsämring och markvård [On soil deterioration and soil conservation]. — Östgöta-Lantmännens Centralfören. Årsb., 18, pp. 19—25, 1 portrait. Norrköping 1957.

The risk of soil deterioration through the development towards a rationalized and extensified farming and the necessity of positive soil-conservation politics are emphasized. *WL.*

JANSSON, SVEN L.: Växtnäringsämnenas förekomst i marken [The occurrence of plant nutrients in the soil]. — HV, 2, pp. 20—29, 1 text-fig. Stockholm 1956.

Deals with chemical and biological fixation and release of plant nutrients in the soil as well as the mode of occurrence of the most important nutrients (N, P, K, Ca, Mg, S, B, Mo, and the metallic trace elements). *WL.*

JANSSON, SVEN L.: Växtnäringsämnenas samspel och balansering [Interaction and balance of plant nutrients]. — HV, 2, pp. 30—40, 4 text-figs. Stockholm 1956.

A discussion of the interaction between different plant nutrients, antagonisms at the nutrition, indirect nutriment effect, and the internal nutriment balance. *WL.*

JANSSON, SVEN L. & VALDMAA, KALJU: Försök att särskilja olika humustyper i odlad jord [Attempt to distinguish different humus types in cultivated soils]. — NJF, 38, pp. 267—275, 1 text-fig. Disc. Svanberg, Jansson, ibid., p. 275. Uppsala 1956.

The methods of investigation are described and exemplified. — Disc. (Svanberg): The importance of lignin to the formation of humus and to the food analysis is discussed. — (Jansson): Also other substances than pure lignin form the insoluble remainder in group analyses but on the other hand all lignin-like substances are not included. *EM.*

JENSEN, S. TOVBORG: Contribution to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, p. 141. Uppsala 1957.

By determination of the production of CO_2 per time unit it was possible to conclude on the extent to which the settling of peat soils is due to mechanical or biochemical causes. *EM.*

JOHANSSON, OLLE: Gödsling med mikroelement [Fertilizing with minor elements]. — LSL, 40 (67), pp. 286—288, 2 text-figs. Stockholm 1956.

Points of view in a concentrated form on questions of minor elements. Copper deficiency occurs particularly in peat soils and in soils with a high humus content but also in other types of soils deficient in nutrients, especially in the interior of Norrland, around the lakes Vänern and Mälaren and in the South-Swedish Highlands. It only appears certain years. Manganese deficiency seems to be most common in soils without or with only a little clay. In soils with pH-values 6—8 the manganese is often fixed in an unavailable form. The risk for boron deficiency seems to decrease with higher clay contents and to increase with higher pH. In soils without clay it is favourable with an increased humus content, while boron deficiency, on the other hand, is quite common in pure humus soils. *HM.*

JOHANSSON, OLLE & EKMAN, PER: Resultat av de senaste årens svenska mikroelementförsök. II. Försök med mangan [Results of Swedish field trials with minor elements in recent years. II. Trials with manganese]. — SJF, Medd. 60—64, pp. 91—138. English summary pp. 135—137. Stockholm 1956.

JUUSELA, TANELI: Dikningens inverkan på bärkraften hos åkrarnas ytskikt [Influence of ditching on the bearing strength of the surface layer of cultivated soils]. — NJF, 39, pp. 146—149, 2 text-figs. Disc. Hallin, Eriksson, Aslyng, Persson, ibid., pp. 149—150. Uppsala 1957.

In consequence of the use of heavy farming implements the influence of ditching on the bearing strength of the surface soil has become an important factor to take into consideration. Investigations have been carried out with various apparatus of which the Proctor needle proved to be most convenient for special investigations in various soils at different contents of water and structures. Among other things it was shown that an underdrain during wet periods is capable of increasing the bearing strength only very near it and for that reason it is also important to drain the surface water rapidly. — Disc. (Eriksson): Since 1947 in Sweden there have been made accurate observations of the bearing strength of cultivated soils. This is at a certain water content dependent on the actual character of the soil profile. The Proctor needle gives particularly in the surface soil values difficult to interpret but is preferred because of several reasons. There is a significant difference in bearing strength between soils with more than about 30 % clay and less. *EM.*

Juusela, Taneli: Kort redogörelse för undersökningar angående jordförbättringsmedlens inverkan på mossodlingarnas frostömhet [Brief account of investigations as to the influence of the means for soil improvement on the frost sensibility of peat soils]. — Grundförbättring, 9, pp. 17—23. English summary p. 53. Uppsala 1956.

Kaila, Armi: Några problem angående jordens organiska substans. Organisk fosfor [Some problems concerning the organic matter in soils. Organic phosphorus]. — NJF, 38, pp. 240—244. Disc. Svanberg, Norrgård, Torstensson, Jansson, ibid., p. 244. Uppsala 1956.

There is not yet any reliable method for determination of organic phosphorus in soils. Indirect analysis is used, and then the difference between the total and the inorganic phosphorus content is assumed to correspond to the phosphorus in organic compounds. It usually represents a great part of the total P-content: on an average about 40 % in mineral soils and about 60 % in organic soils. In mineral soils the amount decreases with increasing depth, in organic soils usually the reverse. Further on the composition of the organic phosphorus fraction and its importance for the plants are discussed. Liming is considered to improve the phosphorus supply of the plants, possibly by mineralization of organic P. But application of lime causes decomposition of the humus substances and for that reason adding of phosphorus fertilizers is recommended. — Disc. (Svanberg): At long sight it must be more favourable to apply phosphorus fertilizers to the soil than to mobilize the phosphorus of the organic matter by liming. — (Jansson): A well-managed fallow intensifies the mineralization of the organic matter in the soil. But from other points of view it is of such a value that the waste of the organic matter is counterbalanced. *EM.*

Kaitera, Pentti: Contribution to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, p. 142. Uppsala 1957.

The factors causing settling in organic soils are so many, that a very great material of observations is required in order to estimate their effects. *EM.*

Kaitera, Pentti: Gemensamma riktlinjer i de nordiska länderna för undersökning över torv- och gyttjemarkernas sättning [Principles common to Scandinavia-Finland for investigation of the settling of peat and mud soils]. — NJF 39, pp. 131—135. Disc. Agerberg, Jensen, Löddesöl, Hallgren, Kaitera, Flodkvist, Dahl, Hallin, Gustafsson, Andersson, ibid., pp. 141—145. Uppsala 1957.

A proposal to principles of investigation common to Scandinavia-Finland in order to secure comparable results of different investigations on settling of peat and mud soils. *EM.*

Karlsson, Nils & Bengtsson, Nils: Jordundersökningar 1/7 1954—30/6 1955 [Soil investigations 1/7 1954—30/6 1955]. — Stat. Lantbrukskem. Kontrollanst., Medd. 17, pp. 13—19. Stockholm 1956.

Investigations of about 30 000 soil samples concerning pH, soluble phosphoric acid, potassium, lime, sulphur compounds, total nitrogen content etc. *EM.*

Karlsson, Nils & Bengtsson, Nils: Kemiska jordanalyser och deras utvärdering [Chemical soil analyses and their application]. — VnN, 12: 5, pp. 12—25, 18 text-figs., 1 plate. Stockholm 1956.

The realization of the soil analysis and its use in judging the need of application of lime, phosphate, potassium, and minor elements are described. A soil map of the Broby farm is included. *WL.*

Karlsson, Nils & Bengtsson, Nils: Om mikroelementundersökningar vid Statens lantbrukskemiska kontrollanstalt [On investigations of minor elements at the State Research Institute of Agricultural Chemistry]. — Stat. Lantbrukskem. Kontrollanst., Medd. 17, pp. 20—32. Stockholm 1956.

A comparison of analyses of soil samples as regards the minor elements copper, manganese, and boron carried out during the years 1949—1955. The material has been subdivided into soil types and pH-classes. *EM.*

Karlsson, Nils, Bengtsson, Nils & Jonsson, Erik: Jordundersökningar 1/7 1955—30/6 1956 [Soil investigations 1/7 1955—30/6 1956]. — Stat. Lantbrukskem. Kontrollanst., Medd. 18, pp. 13—17. Stockholm 1957.

More than 26 000 soil samples have been examined during the period mentioned. An investigation of the reliability of the Result balance proves that it may be used for soil-mapping analyses, if the weighings are at least 2.5 g. *WL.*

Kivinen, Erkki: Mobilisering av kvävet i torvjordar [Mobilization of the nitrogen in peat soils]. — NJF, 38, pp. 257—259. Disc. Svanberg, ibid., p. 259. Uppsala 1956.

The short and cold summer in North Finland and particularly the cold of the peat soils retard the mobilization of the nitrogen. The crop yields will only be satisfactory after application of nitrogen fertilizers in spite of the quite high content of nitrogen in the peat. — Disc. (Svanberg): According to experiences in Sweden the need of cultivated peat soils for nitrogen fertilization increases on higher latitudes. *EM.*

Knutsson, Gunnar: Några resultat från de fastliggande fosfatförsöken [Some results from the permanent phosphate trials]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 22, pp. 112—118. Malmö 1956.

Crop increase at store fertilizing with superphosphate in soils of different phosphate grade and the effect of increasing quantities of superphosphate are dealt with. *WL.*

Knutsson, Gunnar: Några resultat från de fastliggande fosfatförsöken [Some results from the permanent phosphate trials]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 23, pp. 87—93. Malmö 1957.

Investigations of appropriate time-intervals for application of phosphate, most profitable average quantity, the influence of the phosphate application on the phosphate tate of the soil and the effect of increasing quantities of superphosphate to sugar beets are dealt with. *WL.*

Koutler-Andersson, Elisabeth, Tomlinson, T. E., Vahtras, K. & Wiklander, L.: Studies on gyttja soils. V. Description of a hydrologic profile series. — KLA, 22, pp. 279—295, 4 text-figs. Uppsala 1956.

Kristiansson, Sture: Sammansatta gödselmedel [Composite fertilizers]. — Malmöhus Läns Hushållningssällsk. Kvartalsskr., 1956, pp. 102—104. Malmö 1956. Also in Hushållningssällsk. Tidskr., nr 4, 1956.

The pros and cons of the use of composite fertilizers, the so-called complete fertilizers, are dealt with. *WL.*

Lagerroth, Sigvard: Skall vi börja gödsla skogen [Shall we begin to fertilize the forest]? — Lantbrukstjänstemannen, 39, pp. 335—357, 359, 3 text-figs. Stockholm 1957.

Account of a series of trials on forest fertilizing executed on the farm Aske, Uppland. *WL.*

Lamm, Carl Göran: Bestemmelse af jordens redoxniveau [Determination of the redox level in soils]. — NJF, 38, pp. 234—238. Disc. Svanberg, ibid., p. 239. Uppsala 1956.

The author has introduced the conception redox level (*cf.* Lamm: Reduction-oxidation level of soils. — Nature, 177, pp. 620—621, 1956). An empirical expression for the oxidizing and reducing properties of a soil, the redox level, may on certain assumptions be obtained by adding buffer solutions with different redox potentials (potassium ferrous and ferric cyanides in various ratios) and determination of the ΔE-values. E of the pure solution when $\Delta E = 0$ (*i. e.* when the ratio between the ferrous and the ferric cyanides does not change in contact with the soil) corresponds to the redox level. The same principles may be used to determine pH in soils. *HM.* — Disc. (Svanberg): The most interesting thing in connection with determinations of the redox level is whether there is any correlation between it and the contents of manganese, iron, and copper in the plants and their seasonal variations. *EM.*

Larson, Carl: Gödsling och kalkning. Råd med ledning av föreliggande försöksresultat [Fertilizing and liming. Advice with the guidance of recent experimental results]. — Gödslingens planläggning inför 1958, pp. 25—38, 1 text-fig. Stockholm 1957.

General deductions and advice concerning liming, manuring, phosphate, potassium, and nitrogen fertilizing as well as the use of composite fertilizers on the basis of trials directed by the National Agronomy Experiment Station. *WL.*

Larsson, Arne: Inför årets vårbruk [Before the spring farming of the year]! — Lantbrukstidskr. f. Stockholms län och stad, 7: 2, pp. 13—15. Norrtälje 1956 (1957).

Among other things the structure of various soils with regard to the tilling in spring is discussed. *WL.*

Larsson, Nils G.: Markkartering [Soil mapping]. — Malmöhus Läns Hushållningssällsk. Kvartalsskr., 1956, pp. 294—296, 2 text-figs. Malmö 1956.

Brief information on the significance and procedure of soil mapping. *WL.*

Larsson, Nils G.: Om växtnäringstillståndet i Malmöhus läns åkerjordar [On the nutritional state of the cultivated soils of the county of Malmöhus]. —

Malmöhus Läns Hushållningssällsk. Kvartalsskr., 1957, pp. 298—305, 3 text-figs. Malmö 1957.

The nutritional state of the soils of the district is reported as to lime, phosphate, potassium, nitrogen, and minor elements in relation to the geological origin of the material of the soils. *WL.*

Lengdén, V.: Är torvjorden eftersatt när det gäller försök och forskning? [Is the peat soil neglected in experiments and research?] — LSL, 40 (67), pp. 694—695. Stockholm 1956.

A proposal to increase the activity of experimentation and investigation concerning the cultivation possibilities of peat soils. *HM.*

Lindsten, Klas: Växtodling [Cultivation of plants]. — Fakta, 2, pp. 66—69, 18 text-figs. Norrköping 1956.

Brief survey of soils, draining, liming, fertilization, tilling, etc. *WL.*

Linnermark, Nils: Till volymbestämningsmetodiken inom markläran och geologien [A new method for determining volumes in soil science and geology]. — Grundförbättring, 9, pp. 133—140, 2 text-figs. English summary p. 139. Uppsala 1956. Also as Publ. fr. the Inst. of Min., Pal., and Quatern. Geol., Univ. of Lund, Sweden, 36.

Ljunggren, B. & Gustafsson, K. G.: Gotland — ett jordbrukslän [Gotland — an agricultural county]. — Jord och Ungdom, 1957: 10, pp. 5—6, 4 text-figs. Stockholm 1957.

The geology of Gotland and particularly its soils are briefly dealt with. *WL.*

Lundblad, Karl: Bor som växtnäringsämne. Resultat av det senaste årtiondets svenska borgödslingsförsök [Boron as a plant nutrient. Results of experiments with application of boron fertilizers during the last ten years in Sweden]. — VnN, 13, pp. 1: 12—1: 17, 3 text-figs. Stockholm 1957.

Since a German scientist in the early 1930's had demonstrated that boron deficiency is the primary cause of the heart rot disease in sugar beets, experiments with boron fertilizing were carried out all over the world. In Swedish agriculture boron deficiency is a common phenomenon in almost all parts of the country, but with certain regional differences. It occurs with various intensity different years. *EM.*

Lundblad, Karl: Hur bör man tillföra spårämnen [How are trace elements to be supplied]? — Gödslingens planläggning inför 1957, pp. 48—50, 2 text-figs. Stockholm 1956.

Advice is given as to the appropriate way of application of the trace elements boron, manganese, and copper to the soils. *WL.*

Lundblad, Karl: Jordförstöring på myrjord [Soil destruction in organic soils]. — SJF, Medd. 78, 23 pp. English summary pp. 20—22. Stockholm 1957.

Lundblad, Karl: Koppar som växtnäringsämne. Resultat av det senaste årtiondets svenska kopparförsök [Copper as a plant nutrient. Results of experiments with copper in Sweden during the last ten years]. — VnN, 12, pp. 4: 12—4: 16. Stockholm 1956.

Concerning the need for copper in soils there are regional differences. Areas of deficiency are particularly the interior of Norrland, the South-Swedish Highlands, Southern Gotland, and areas around the lakes Vänern, Hjälmaren, and Mälaren. Copper deficiency results in poor crop yields, especially of cereals, while potatoes are not affected. Deficiency in this element is most likely to be found in soils with a high humus content, but clays are seldom lacking in copper. In soils in general deficient in nutrients, copper often is present in insufficient amounts, but there seems not to be any correlation between deficiencies in copper and in other minor elements. Application of copper sulphate removes the deficiency. *EM.*

Lundblad, Karl: Mangan som växtnäringsämne. Resultat av det senaste årtiondets svenska manganförsök [Manganese as a plant nutrient. Results of experiments with manganese in Sweden during the last decade]. — VnN, 13, pp. 3: 18—3: 22, 2 text-figs. Stockholm 1957.

Manganese deficiency occurs in all parts of Sweden, but is most common in limestone areas. Potatoes seem to be most dependent on manganese, but also cereals, beets etc. increase the yields when manganese is applied. The »grey speck» disease of oats is the deficiency symptom most studied. Deficiency may occur in all types of soils but is usually most serious in soils without or with only a little clay. The humus content plays a less role. Improvements are attained by application of manganese sulphate in many soils, but in soils lacking in clay and humus with pH about 7 the effect of manganese sprays is better. *EM.*

Lundblad, Karl: Markvård och kalkning [Soil conservation and liming]. — VnN, 13, pp. 2: 5—2: 9, 1 text-fig. Stockholm 1957.

In the conception of soil conservation there are summarized all measures to maintain or increase soil fertility, *i. a.* drainage, tillage, application of lime and manure, and humus improving measures. Because of the many functions of lime in the soil, liming is an important practice in a rational soil conservation management. The clay and humus contents as well as the pH determine the need for lime. According to recent calculations there are in Sweden 1 650 000 ha cultivated land that requires basic liming, but also the need for maintenance liming is great. *EM.*

Lundblad, Karl: Myrjordarna i forskning och försök [The peat soils in research and experiments]. — LSL, 40 (67), pp. 716—717. Stockholm 1956.

A contribution supporting Lengdén's proposal to increase experiments and research concerning the practical use of peat soils. *HM.*

Lundblad, Karl: Mångårig vall på myrjord [Pasture of many years' duration on organic soils]. — BVM, 8, pp. 109—113. Uppsala 1956.

In the introduction the problem of soil destruction is discussed with special regard to organic soils, including settling, erosion, and removal by cultivation in a proper sense. *WL.*

Lundblad, Karl: Natrium såsom växtnäringsämne [Sodium as a plant nutrient]. — VnN, 12, pp. 3: 23—3: 26, 2 text-figs. Stockholm 1956.

Deficiency of sodium gives rise to particular diseases in certain plants, which points out that sodium performs a function in the plant not yet known. The author considers it probable that sodium is indispensable for all plants but for most of them in small amounts. *EM.*

Lundblad, Karl: Om råfosfater och jämförande försök med sådana fosforgödselmedel på myrjord [On rock phosphates and comparative trials with such phosphorus fertilizers in organic soils]. — SJF, Medd. 80, 52 pp. English summary pp. 47—49. Stockholm 1957.

LUNDBLAD, KARL: Resultat av forskning och försök rörande koppar och mangan i svensk växtodling [Results of research and trials concerning copper and manganese in Swedish agriculture]. — Jord-Gröda-Djur, 12, pp. 70—75. Stockholm (1955) 1956.

The results of field trials with copper and manganese are reported with special regard to deficiencies of these metals in cultivated soils in different parts of the country. *WL.*

LUNDBLAD, KARL: Råfosfater som gödselmedel [Rock phosphates as fertilizers]. — VnN, 13, pp. 5: 6—5: 9. Stockholm 1957.

A comparison between application of natural rock phosphates and commercial phosphate fertilizers shows that the former are in general considerably inferior. *EM.*

LUNDBLAD, K.: Växtnäringstillförsel på myrjordar [Application of plant nutrients on peat soils]. — HV, 4, pp. 78—83, 3 text-figs. Stockholm 1956.

Brief outline of the need of lime, manure, and artificial fertilizers (P, K, N, Mn, Cu, and B) of the peat soils. *WL.*

LUNDBLAD, KARL & EKMAN, PER: Svenska kalkningsförsök [Swedish liming experiments]. — VnN, 12, pp. 1: 7—1: 11. Stockholm 1956.

A review of more than 2 000 liming experiments carried out since 1920 shows that liming of acid mineral soils is profitable but also that liming of less acid soils often will increase the crop yields. The exchangeable amount of calcium in the soil ought to be 3 000 kg/ha corresponding to about 4 000 kg lime. This is not sufficient, however, in soils with a high content of very acid substances, *e. g.* the so-called »alum soils» in Norrland. *EM.*

LUNDBLAD, KARL & JOHANSSON, OLLE: Resultat av de senaste årens svenska mikroelementförsök. I. Försök med koppar [Results of Swedish field trials with minor elements in recent years. I. Trials with copper]. — SJF, Medd. 60—64, pp. 39—90, 1 text-fig. English summary pp. 85—90. Stockholm 1956.

LUNDBLAD, KARL, JOHANSSON, OLLE & PHILIPSON, TORE: Resultat av de senaste årens svenska mikroelementförsök. III. Försök med bor [Results of Swedish field trials with minor elements in recent years. III. Trials with boron]. — SJF, Medd. 60—64, pp. 139—174. English summary pp. 171—173. Stockholm 1956.

LUNDEGÅRDH, P. H.: Något om malmers inverkan på moränens finmaterial [Influence of degraded ores upon fine fractions of till]. — GFF, 78, pp. 97—100, 2 text-figs. English abstract p. 97. Stockholm 1956.

LÖDDESÖL, AASULV: Contributions to discussion after lectures by Pentti Kaitera, Aasulv Løddesøl, and Veikko Tipuri: De organogena jordarnas sättning [Settling of the organic soils]. — NJF, 39, pp. 141, 144. Uppsala 1957.

For the settling of an organic soil the depth of drainage is more important than the total depth of peat, even if this factor may have an influence. *EM.*

LØDDESØL, AASULV: Synkningsproblemer på myr [Problems of settling in mires]. — NJF, 39, pp. 136—139. Disc. Agerberg, Jensen, Löddesöl, Hallgren, Kaitera, Flodkvist, Dahl, Hallin, Gustafsson, Andersson, ibid., pp. 141—145. Uppsala 1957.

The causes of settling in peat soils are the water draw off at the very draining, at which the pore space instead will be filled with air, the increasing pressure at the application of soil improving substances in connection with cultivation, and a slow reduction of volume by oxidation of the organic matter. An account is given of several factors (topographical, hydrological, peat geological etc.) which affect the extent of settling and also the possibilities of calculating it in advance with Svadkovsky's formula. *EM.*

Malmström, Carl: Om möjligheterna att omföra myrmark till produktiv skogsmark [On the possibilities of transferring peat-ground to productive woodland]. — BVM, 8, pp. 125—130. Uppsala 1956.

Deals *inter alia* with the draining possibilities and nutritive conditions of peat-grounds and gives general aspects and guiding principles for the application of nutrients to peat-soils. *WL.*

Malmström, Carl: Om skogsproduktionens näringsekologiska förutsättningar och möjligheterna att påverka dem [On the nutrition-ecological requirements of forest production and the factors affecting them]. — SST, 54, pp. 123—140, 4 text-figs. Norrtälje 1956. Also as Medd. fr. Statens Skogsforskningsinst., Ser. upps., No. 47.

A general introduction to the nutrition ecology of forests with respect to the geological conditions, the supply of nutrients from surrounding land by run-off water and soil blowing, from decaying organic matter, and from the atmosphere as well as the possibilities of maintaining or improving the forest yield by management practices directed on the trees and the state of the forest soil. By other measures, such as introducing foreign or new tree sorts, drainage, and application of fertilizers, the yield may be increased still more. *EM.*

Malmström, Carl: Report of a manuring experiment to illustrate the nutritive ecology conditions for bringing peat-grounds under cultivation. — Int. Union for the Conserv. of Nature and Nat. Res. Sixth Techn. Meeting. Edinburgh June 1956. Proc. and Papers, pp. 161—162. London 1957.

Malmström, Carl: Skogsproduktionens näringsekologiska förutsättningar [The nutrition-ecological requirements of forest production]. — Skogen, 43, p. 310. Stockholm 1956.

A brief summary of the above-mentioned paper in Sv. Skogsvårdsfören. Tidskr. *EM.*

Malmström, Carl: Statens skogsforskningsinstitut. Avdelningen för botanik och marklära [The Forest Research Institute of Sweden. Department of botany and soils]. — Svensk Naturvetenskap 1956. SNFÅ, 10, pp. 328—330. English summary pp. 340—341. Stockholm 1957.

Manchester, Harland: De mystiska mikroelementen [The mysterious minor elements]. — Det Bästa, 14: 8, pp. 51—54, 2 text-figs. Stockholm 1956.

A popular account of the importance of some minor elements (cobalt, zinc, copper, boron, manganese) for the fertility of soils with examples from USA. *WL.*

Mars, K.-E. & Söderström, Th.: Ny borrmetod [New boring method]. — Kommunaltekn. Tidskr., 23, pp. 70—72, 3 text-figs. Stockholm 1957.

A new soil borer for boring in firm soils, such as gravel, sand, and till, is described. So far the greatest boring depth is 36 m. *WL.*

MATTSON, SANTE: Phosphate relationships of soil and plant. XIII. PO_4 as a Ca precipitant in cation exchange systems. — KLA, 22, pp. 101—106, 5 text-figs. Uppsala 1956.

MELCHERT, HARALD: Försök med mikroelement, utförda under åren 1945—1955 [Trials with microelements, executed during the years 1945—1955]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 22, pp. 105—111. Malmö 1956.

Results of application of the minor elements boron, manganese, and copper to different Scanian soils are presented. *WL.*

MÅNSSON, BERTIL: Sammanställning av gödslingsförsök med kalisalt åren 1947—56 [Summary of fertilizing trials with potassium salt in the years 1947—56]. — Medd. fr. Centralstyr. f. Malmöhus Läns förs.- och växtskyddsringar, 23, pp. 106—110. Malmö 1957.

The differences between the results of potassium application in soils with different potassium state, clay content, pH, and humus content are small. *WL.*

MÅNSSON, ERIK: Fosfathalten i Östergötlands åkerjordar [The phosphate content of the cultivated soils of Östergötland]. — Östgöta-Lantmännens Centralfören. Årsb., 17, pp. 31—35, 1 text-fig., 1 portrait. Norrköping 1956.

The soil mapping in the different agricultural districts of Östergötland shows that the cultivated soils of the county generally are in a weak phosphate state. Old settlements and areas of ancient monuments have high phosphate contents. *WL.*

MÅNSSON, ERIK: Näringsinnehållet i Östergötlands åkerjordar [The nutrient content of the cultivated soils of Östergötland]. — VnN, 12: 5, pp. 37—43, 6 text-figs. Stockholm 1956.

The phosphate state is generally weak, the potassium state satisfactory in clay soils, unsatisfactory in sandy soils, the lime state tolerably good. Deficiency of boron common, of copper and manganese in 1/5 of the soil samples investigated. *WL.*

MÅNSSON, ERIK: Näringsinnehållet i Östergötlands åkerjordar [The nutrient content of the cultivated soils of Östergötland]. — Östergötl. Läns Hushållningssällsk. Handl. 1956, 2, pp. 11—28, 9 text-figs. Linköping 1956.

Account of the contents of phosphate, potassium, and minor elements as well as pH of the soils in different parts of the county according to the soil mapping. *WL.*

MÅNSSON, ERIK: Åkerjord och växtodling i Östergötland [Cultivated soils and plant growing in Östergötland]. — LSL, 41 (68), pp. 540—542, 4 text-figs. Stockholm 1957.

A general survey of the soils of the province. About 1/3 of the arable land is soil mapped. Of this about 2/3 showed deficiency in phosphate, but potassium deficiency is less common because of the clay content of the soils. Concerning minor elements copper deficiency has been established in sandy till and in organic soils, boron deficiency is common, and manganese deficiency occurs in about 1/5 of the samples investigated. *HM.*

MÅNSSON, ERIK: Östergötlands växtodling och dess förutsättningar [The farming in Östergötland and its conditions]. — Lantbrukstjänstemannen, 39, pp. 11, 45—47, 1 portrait. Stockholm 1957.

A short description of the soils of the province and their nutritional state is given. *WL.*

Nilsson, Nils: Våra åkerjordars krav på olika behandling och beredning [The demands of our cultivated soils for different treatment and cultivation]. — Lantbrukstjänstemannen, 38, pp. 173—175, 184, 1 portrait. Disc. Krushage, Eklund, Lord, Fjellstedt, ibid., p. 184. Stockholm 1956.

The physical properties of the different soils with regard to the tillage are discussed. *WL.*

Nordenborg, M. O.: Lilla jordbruksläran. Lärobok för skolor, kurser och självstudium [The small text-book of farming. For schools, courses, and private study]. — 3rd ed., LT:s Förl., 491 pp., 204 text-figs., 9 plates. Stockholm 1956.

Contains *inter alia* chapters on soil science, contents of water and air in the soil, plant nutrients, fertilizers, and liming. *WL.*

Nordström, Lennart: Olof Tamms akademiska avhandling år 1920. Några citat och reflexioner i anslutning till den skogliga marklärans utveckling och betydelse för skogsskötseln [Olof Tamm's academical dissertation of 1920. Some quotations and comments in connection with the progress of forestal soil science and its importance for forestry]. — SST, 55, pp. 455—462. Norrtälje 1957.

The dissertation mentioned dealt with soil studies in the North-Swedish conifer region and was published in Reports of the Swedish Institute of Experimental Forestry, 17. *WL.*

Norrgård, A.: Jord, dränering, bevattning, humusvård. Glimtar från NJF:s jordsektions kongressförhandlingar och studieresor sommaren 1956 [Soil, drainage, irrigation, humus conservation. Glimpses from the congress transactions and excursions of the Soil Section of the Scandinavian Society of Agricultural Research in the summer of 1956]. — Grundförbättring, 9, pp. 141—153, 4 text-figs. English summary p. 178. Uppsala 1956.

Norrgård, A.: Jord och gödsling. Glimtar från NJF:s jordsektion [Soil and fertilization. Glimpses from the Soil Section of NJF]. — LSL, 40 (67), pp. 700—702, 5 text-figs. Stockholm 1956.

Brief summary of transactions and excursions of the Soil Section at the congress of the Scandinavian Society of Agricultural Research in 1956. *WL.*

Norrgård, A.: Teknisk utrustning för försök. En markläredag på Ultuna, Uppsala [Technical equipment for experiments. A day of soil science at Ultuna, Uppsala]. — LSL, 41 (68), pp. 916—917, 5 text-figs. Stockholm 1957.

Field apparatus for agrophysical investigations were demonstrated. *HM.*

Norrgård, A.: Vatten- och markstudier i södra Kalmar och på Öland [Studies of water and soils in South Kalmar and Öland]. — Grundförbättring, 10, pp. 211—220, 4 text-figs. English summary p. 244. Uppsala 1957.

Norrgård, A.: Vattenbrist och översvämningar. Vatten- och markproblem i södra Kalmar län [Water deficiency and floods. Water and soil problems in South Kalmar county]. — LSL, 41 (68), pp. 824—827, 6 text-figs. Stockholm 1957.

Account of an excursion in 1957 arranged by the Society for Agronomic Hydrotechnics. *WL.*

NÄÄS, OLOV: Apparatur för studium av markens vattenhushållning [An apparatus for the study of the water supply in soils]. — Grundförbättring, 10, pp. 152—153, 1 text-fig. Uppsala 1957.

A short description of a lysimeter apparatus. *EM.*

NÄÄS, OLOV: Jordborr för markkartering och markfysikaliska undersökningar [A borer for soil mapping and investigations of physical properties of soils]. — LSL, 40 (67), pp. 408—409, 3 text-figs. Stockholm 1956.

A description of a new tube borer is given. *HM.*

NÄÄS, OLOV: Markens vattenhushållning vid bevattning [Water economy of the soil in irrigation]. — Grundförbättring, 10, pp. 20—45, 11 text-figs. English summary p. 86. Uppsala 1957.

NÄÄS, OLOV: Undersökningar rörande möjligheterna att utnyttja Östersjöns vatten för bevattning av betes- och slåtterväxter [Investigations as to the possibilities of using water from the Baltic for irrigation of grass and leguminous plants]. — Grundförbättring, 9, pp. 111—132, 206—226; 10, pp. 46—84, 124—150, 32 text-figs. English summary 9, pp. 177—178, 258; 10, pp. 86, 154. Uppsala 1956—57.

NÄÄS, O. & ODENTUN, E.: Nytt jordborr för markfysikaliska undersökningar [A new borer for soil physical investigations]. — Grundförbättring, 10, pp. 193—199, 6 text-figs. English summary p. 200. Uppsala 1957.

NÕMMIK, HANS: Fixation and defixation of ammonium in soils. — Acta Agr. Scand., 7, pp. 395—436, 9 text-figs. Uppsala 1957.

NÕMMIK, HANS: Förluster av salpeterkväve genom denitrifikation [Losses of nitrate nitrogen by denitrification]. — VnN, 13, pp. 2: 21—2: 26, 4 text-figs. Stockholm 1957.

The nitrate in soils is lost by leaching and by denitrification. The leaching losses are smallest in South Sweden, especially in Scania and Blekinge. Nitrate reduction occurs when the water content of the soil exceeds certain limit values, while the air circulation then is considerably reduced. The author considers that the occurrence of N_2O in the atmosphere indicates that losses of nitrate nitrogen take place in nature. *EM.*

NÕMMIK, HANS: Investigations on denitrification in soil. — Acta Agr. Scand., 6, pp. 195—228, 11 text-figs. Uppsala 1956.

ODÉN, SVANTE: Förslag till klassifikation av markens porer [Proposal to classification of the soil pore system]. — NJF, 38, pp. 276—278, 1 text-fig. Uppsala 1956.

The author's classification proposal requires a dimensional expression of the soil pore system in combination with the introduction of definite class limits experimentally determined using Stoke's law as starting-point. *KN.*

ODÉN, SVANTE: Genmäle till prof. I. Th. Rosenqvist angående bevätningsvärme hos ler och humus [Reply to prof. I. Th. Rosenqvist concerning the heat of wetting of clay and humus]. — GFF, 79, pp. 91—92. Stockholm 1957. Also in Reports from the Swedish Society for Clay Research, 7.

Author discusses the discrepancies in the relation between heat of wetting and exchange capacity of clays as determined by him and Rosenqvist, respectively, and maintains that the Ca-45 method used by Rosenqvist has given too high values of the exchange capacity. *WL.*

ODÉN, SVANTE: Heat of wetting of soils. I. A micro method for the determination of heat of wetting. — KLA, 22, pp. 269—277, 4 text-figs. Uppsala 1956.

ODÉN, SVANTE: Om bevätningsvärme hos ler och humus [On heat of wetting of clay and humus]. — GFF, 78, pp. 536—552, 7 text-figs. English abstract p. 536. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 6.

OLESEN, JOHS.: Finns det dåliga fläckar i grödorna? »Fläckanalyser» kunna i så fall avslöja orsakerna [Are there bad spots in the crops? »Spot tests» are then able to reveal the causes]. — VnN, 13, pp. 5: 14—5: 18, 4 text-figs. Stockholm 1957.

Observations of badly growing spots will give information of the need for lime and fertilizers. *EM.*

OLOFSSON, SANFRID: Analysresultat för växtmassa från blekefält i Mästermyr [Results of analyses of ley-crop from fields of white marl in Mästermyr]. — K. Skogs- och Lantbruksakad. Tidskr., 96, pp. 145—155. English summary pp. 153—154. Uppsala 1957.

OLOFSSON, S.: Dräneringen av torvjordarna [The draining of the peat soils]. — BVM, 8, pp. 149—150. Uppsala 1956.

Practical advice for the draining of bog areas. Among other things it is emphasized that the permeability values of peat soils may differ a great deal. *WL.*

OLOFSSON, SANFRID: Tillförsel av koppar och mangan till kalkrika organogena jordar [Supplying copper and manganese to organic soils rich in lime]. — SJF, Medd. 60—64, pp. 175—210. English summary pp. 207—209. Stockholm 1956.

OLSEN, OLE BAGGE: Jorden lever [The earth is living]. — Viking Bokförl., 115 pp., 21 text-figs. Gävle 1956.

A popular account of some problems of modern agriculture, such as the humus question, the water supply, the fertilizing etc. *WL.*

PERMAN, OLOF: Kalken och dess användning i historisk belysning [The lime and its use in the light of history]. — HV, 1, pp. 25—32, 1 text-fig. Stockholm 1956.

Short historical account of the use of lime as a means of soil-improvement with quotations from earlier authors as well as information of localization and development of the Swedish lime industry. *WL.*

PORSE, Ö.: Förklaring till markkarta inom Kopparbergs län jämte gödslings- och kalkningsråd [Explanation to soil map in the county of Kopparberg together with advice on fertilizing and liming]. — Lantbrukstidskr. f. Dalarna 1956, pp. 90—91. Falun 1956.

Advice is given for mineral soils as well as for organic soils. *WL.*

PORSE, Ö.: Gödslings- och kalkningsråd till markkarta i Kopparbergs län [Advice on fertilizing and liming to soil map in the county of Kopparberg]. — VnN, 12: 5, pp. 35—36. Stockholm 1956.

The need of lime and other fertilizers in mineral- and organic soils is stated. *WL.*

PORSE, ÖSTEN: Jordbruket i Kopparbergs län [The farming in the county of Kopparberg]. — BVM, 8, pp. 59—66, 7 text-figs. Uppsala 1956.

A brief account of the soils and their nutritional condition in the area is included in the article. *WL.*

PORSE, ÖSTEN: Sammanställningar av resultaten från gödslingsförsök [Summaries of the results from fertilizing trials]. — Lantbrukstidskr. f. Dalarna 1956, pp. 61—64. Falun 1956.

The trials have reference to the application of phosphate, nitrogen, and boron as well as stable-dung. *WL.*

PUROKOSKI, PAAVO: Förekomst och föreningar av svavel i gyttjelera [Occurrence and compounds of sulphur in mud-clay]. — NJF, 38, pp. 263—266. Uppsala 1956.

An investigation of mud-clay soils in the coastal areas of the Gulfs of Finland and Bothnia has shown that the ratio between the various sulphur compounds gives a distinct picture of the aerobic and anaerobic conditions. *EM.*

PUUSTJÄRVI, VILJO: On the base status of peat soils. — Acta Agr. Scand., 7, pp. 190—223, 17 text-figs. Uppsala 1957.

PUUSTJÄRVI, V.: On the cation exchange capacity of peats and on the factors of influence upon its formation. — Acta Agr. Scand., 6, pp. 410—449, 7 text-figs. Uppsala 1957.

PUUSTJÄRVI, VILJO: On the factors resulting in uneven growth on reclaimed treeless fen soil. — Acta Agr. Scand., 6, pp. 45—63. Uppsala 1956.

RENGMARK, F. & FREDÉN, S.: Apparatus for determining the rate of diffusion of water in soil. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, 1, pp. 98—99, 4 text-figs. French summary p. 98. London 1957.

ROMELL, LARS GUNNAR: An experiment in planning. — Int. Union for the Conserv. of Nature and Nat. Res. Sixth Techn. Meeting. Edinburgh June 1956. Proc. and Papers, pp. 256—257. French summary p. 257. Disc. Romell, Matthew, ibid., pp. 257—258. London 1957.

ROMELL, L. G.: Skogens kalkfråga [The lime question in forestry]. — BN, 110, pp. 132—133. Lund 1957.

Experiments show that first of all it is the nitrogen available and to a certain extent the phosphorus supply, but not the lime, which is of importance to a good forest growth. Lime does not properly favour the growth but the coming up of seedlings as shown in beech forests in Denmark. To conifers, however, the humus cover is an excellent substratum also without lime. *EM.*

ROMELL, L. G.: Soil activation. — Int. Union for the Conserv. of Nature and Nat. Res. Sixth Techn. Meeting. Edinburgh June 1956. Proc. and Papers, pp. 171—172. Disc. Romell, Satchell, Edwards, ibid., pp. 173—174. London 1957.

ROSÉN, BO: Markvård i Sverige och utlandet [Soil conservation in Sweden and other countries]. — SN. Sv. Naturskyddsfören. Tidskr., 48, pp. 135—139, 2 text-figs. Uddevalla 1957.

Comments to the report of a committee of 1949 on soil erosion as well as a survey of erosion questions in foreign countries and measures taken under the auspices of the UN. A legislation for the protection of exploited peat soils like that in Norway is proposed, which provides that a peat cover of a certain thickness must be left, that stumps must be removed, and remaining peat embankments levelled. *EM.*

ROSENQVIST, IVAN TH.: Måling av jords korrosivitet [Measurement of the corrosivity of soil]. — TT, 86, pp. 229—231. Norrköping 1956.

The mechanism of corrosion of steel piles in soil and the use of the corrosion probe for measuring resistivity and electromotoric power of soils are described. From these measurements the corrosion risk may be estimated. *WL.*

ROSENQVIST, I. TH.: Om bevätningsvärme hos ler och humus [On heat of wetting of clay and humus]. — GFF, 79, pp. 90—91. Stockholm 1957. Also in Reports from the Swedish Society for Clay Research, 7.

A discussion of the causes of discrepancies as to the relation between heat of wetting and ion exchange capacity in Norwegian sodium clays as determined by the author and in Swedish calcium clays according to S. Odén. Author believes the differences to be due to the method used by Odén for the determination of the heat of wetting. *WL.*

ROSENQVIST, IVAN TH.: Om naturlige og kunstige leirers skjærfasthet [On the shear strength of natural and artificial clays]. — GFF, 78, pp. 141—143. English abstract p. 141. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 5.

ROTH, ERIK: Inför vårbruket [At the spring farming]. — Lantbrukstjänstemannen, 38, pp. 63—65, 85, 90, 92, 2 text-figs., 1 portrait. Stockholm 1956.

The properties of different soils with regard to tilling are dealt with and advice is given in this connection. *WL.*

SAARE, ERIK: Värmeledningsförmågan hos några kvartära leror [Heat conduction in some Quaternary clays]. — GFF, 78, pp. 155—156. Stockholm 1956. Also in Reports from the Swedish Society for Clay Research, 5.

The method of measuring is briefly described. *WL.*

SAARE, E.: Värmeledningsförmågan hos några markprofiler [Heat conduction in some soil profiles]. — NGT, 36, p. 82. Bergen 1956.

The heat conduction in soils may be determined by a probe warmed up by an electric current. The temperature change is measured with a thermoelement and an electrically registering potentiometer. From the curve of rising temperature obtained, the conductivity coefficient of the soil type can be determined. *EM.*

SAARE, ERIK & WENNER, CARL-GÖSTA: Värmeledningstal hos olika jordarter [Thermal conductivity of soils]. — Statens Nämnd för Byggnadsforskn., Handl., 31, 128 pp., 55 text-figs., 1 plate. English summary pp. 124—126. Norrköping 1957.

SCHLICHTING, ERNST & WIKLANDER, LAMBERT: Studien über Gyttja-Böden. IV. Kurze Mitteilung über die Bindung des Kupfers in einigen Profilen [Studies of gyttja soils. IV. Brief communication on the binding of copper in some profiles]. — KLA, 22, pp. 93—99. Uppsala 1956.

SEMB, GUNNAR: Magnesiuminnholdet i norske jordprøver [The magnesium content of Norwegian soil samples]. — NJF, 38, pp. 219—223. Uppsala 1956.

More than 2 500 magnesium analyses of soil samples from various parts of Norway show that the magnesium content is high in Vestlandet but very low in Telemark. *EM.*

SILFVERBERG, LENNART: Chemical determination of soil organic matter. A critical review of existing methods. — Royal Swedish Geotechn. Inst. Proc., No. 15, 48 pp., 8 text-figs. Stockholm 1957 (1958).

SORTEBERG, ASBJØRN: Magnesiumgjödsling [Application of magnesium]. — NJF, 38, pp. 214—218. Disc. Svanberg, Lamm, Tönnesson, Sorteberg, ibid., pp. 232—233. Uppsala 1956.

In Norway magnesium deficiency in fruit trees is well-known, but in herbs it was very little known until a few years ago. Pot experiments carried out show that even if magnesium deficiency has been established in cultivated plants, application of magnesium hardly gives increased crop yields. On the other hand, there is considered to be a correlation between shortage of this element and cramp in cattle. — Disc. (Svanberg): In Sweden the problem concerning the magnesium supply of cultivated plants is greater in horticulture than in agriculture. Application of dolomite powder is recommended for soils with magnesium deficiency in consequence of excessive fertilization with potassium. In magnesium analyses it is important to observe if there is a surplus of potassium which, rather than the amount of exchangeable magnesium, may cause magnesium effects. — (Lamm): In order to increase the content of magnesium in greenhouse soils addition of dolomite powder is unsuitable because of the usually high calcium contents. The possibility of using serpentine in greenhouses is discussed. — (Tönnesson): The fertilizer industry in Norway has possibilities of manufacturing suitable magnesium products if the requirement for them becomes large enough. — (Sorteberg): As application of serpentine for the magnesium supply of soils has given good results in New Zealand, pot tests with oats in acid mineral soil have been carried out in Norway. Without application of magnesium the yield was very low but in these experiments it was normal. *EM.*

SORTEBERG, ASBJØRN: Molybdenmangel på planter [Molybdenum deficiency in plants]. — NJF, 38, pp. 210—213. Uppsala 1956.

Pot experiments carried out in Norway show that application of molybdenum is favourable to several plants. Among other things the grain formation of barley increases. Molybdenum deficiency appears in the leaves as chlorosis, later on as wilting. The function of molybdenum in plants is not quite clear, but it is considered to be necessary to the protein synthesis. Possibly it is not an essential nutrient, but its effect is due to the nature of the nitrogen taken up by the plants. *EM.*

Steen, Eliel: Betningens inverkan på vegetation och mark i två typer av hagmarksbeten [Influence of grazing on vegetation and soil in two types of partly forested natural pasture]. — SJF, Medd. 71—75, pp. 119—134. English summary pp. 133—134. Stockholm 1956.

Steen, Eliel: Betningens inverkan på växtlighet och mark i en mälarstrandäng [Influence of grazing on plant cover and soil in a marshy meadow at Lake Mälaren]. — SJF, Medd. 83, 85 pp., 16 text-figs. English summary pp. 71—76. Stockholm 1957.

Steen, Eliel: Lutningsriktningens och lutningsgradens inflytande på växtlighet och mark i ett naturbete [Influence of exposure and slope on vegetation and soil in a natural pasture]. — SJF, Medd. 86, 54 pp., 7 text-figs. English summary pp. 47—50. Stockholm 1957.

Steen, Eliel: Undersökningar över betningens inflytande i tre naturbeten [Investigations into the effect of grazing on three natural pastures]. — SJF, Medd. 71—75, pp. 97—118, 3 text-figs. English summary pp. 115—117. Stockholm 1956.

Steen, Eliel & Waldmaa, Kalju: Agrogeologisk-botanisk förundersökning i beteskultiveringsförsöket vid Rödningsberg. (Redogörelse nr 2 för betesförsök i Norrland) [Agrogeological and botanical pre-investigation in the pasture cultivation trial at Rödningsberg. (Report no. 2 on pasture trials in Norrland)]. — SJF, Medd. 65—70, pp. 37—54, 4 text-figs., 3 plates. German summary pp. 51—53. Stockholm 1956.

Stålfelt, M. G.: Vattnets rörelse i moränjord och marktäcke [The movement of water in till and ground cover]. — Dansk Skovforen. Tidsskr., 41, pp. 209—222. København 1956.

Reply to critique from H. Holstener-Jørgensen of an earlier work by the author on the water balance of soil and forest. *WL.*

Svanberg, Olof: Grundförbättringens betydelse för husdjursskötseln [Importance of soil improvement for the cattle breeding]. — Grundförbättring, 9, pp. 1—16. English summary pp. 52—53. Uppsala 1956.

Svanberg, Olof: Mikroelementfrågor [Problems of minor elements]. — LSL, 40 (67), p. 1057. Stockholm 1956.

Review of a lecture held in Stockholm in 1956 at a meeting of the leaders of the Swedish experimental activity in agriculture. *WL.*

Svanberg, Olof: Om näringsbehov hos växter, djur och människor [On the need of nutriment of plants, animals, and men]. — K. Vet.-Soc. i Uppsala Årsb. 1955, pp. 24—45, 2 text-figs. Uppsala 1956.

Inter alia the content of the soils of certain plant nutrients, signs of deficiency, and application of plant nutrients are dealt with. *WL.*

Söderblom, R.: Some investigations concerning salt in clay. — Proc. of the Fourth Int. Conf. on Soil Mechanics and Foundation Engineering, London, August 1957, 1, pp. 111—115, 8 text-figs. French summary p. 111. London 1957.

SÖDERSTRÖM, VADIM: Några orienterande studier angående markfuktigheten i plantrutor och under hyggesvegetation [Some introductory studies concerning soil moisture in test plots and beneath ground vegetation in forest cleared areas]. — SST, 55, pp. 483—504, 10 text-figs. Norrtälje 1957.

This investigation has been concentrated to the layers down to 20 cm below the surface. The author shows that the soil during dry periods becomes considerably drier beneath growing vegetation in cleared areas than where the mineral soil is exposed. Further, the results suggest that the moisture below a soil-surface free from vegetation but covered with humus often is very high immediately below the humus cover and rapidly decreases lower down. Beneath abundant and dense vegetation the moisture content seems to be low nearest the humus and increases slowly downwards. *HM.*

TAINIO, AARNE: Finska försök med super- och finfosfat [Finnish trials with super- and fine-phosphate]. — Jord-Gröda-Djur, 14, pp. 87—95, 1 portrait. Stockholm 1957 (1958).

The trials prove that the relative effect of the fine-phosphate (Reno phosphate) is improved in course of time. After ten years it amounts to more than 90 % of that of the superphosphate. *WL.*

TAMM, CARL OLOF: Ett exempel på markprofilbildningen i gamla kolbottnar [An example of profile development in soil disturbed in connection with charcoaling]. — SST, 55, pp. 505—514, 2 text-figs. English summary pp. 513—514. Norrtälje 1957.

TAMM, CARL OLOF: Studier över skogens näringsförhållanden. III. Försök med tillförsel av växtnäringsämnen till ett skogsbestånd på mager sandmark [Studies on forest nutrition. III. Experiments with supply of plant nutrients to a forest stand on a poor sandy site]. — Medd. fr. Statens Skogsforskn. Inst., 46: 3, 84 pp., 23 text-figs. English summaries pp. 53—65, 72—73, 78—79, 82—84. Stockholm (1956) 1957.

TAMM, CARL OLOF: Studier över skogens näringsförhållanden. IV. Effekten av kalium- och fosfortillförsel till ett oväxtligt bestånd på dikad myr [Studies on forest nutrition. IV. The effect of supply of potassium and phosphorus to a poor stand on drained peat]. — Medd. fr. Statens Skogsforskn. Inst., 46: 7, 27 pp., 5 text-figs. English summary pp. 26—27. Stockholm (1956) 1957.

TAMM, CARL OLOF & TROEDSSON, TRYGGVE: A new method for the study of water movement in soil. — GFF, 79, pp. 581—587, 2 text-figs., 1 plate. Stockholm 1957.

TIPURI, VEIKKO: Om sättning på gyttjejordar [On settling of mud soils]. — NJF, 39, pp. 140—141. Disc. Agerberg, Jensen, Löddesöl, Hallgren, Kaitera, Flodkvist, Dahl, Hallin, Gustafsson, Andersson, ibid., pp. 141—145. Uppsala 1957.

Author gives an account of investigations of the settling of mud soils in Finland. For the laboratory experiments he has designed a new handy œdometer apparatus. *EM.*

TORSTENSSON, G.: Kreaturslöst contra kreaturshållande jordbruk. Jordens humusproblem [Animal-free *v.* animal-keeping farming. The humus problem of the soil]. — Lantbruksveckan 1956, pp. 65—75, 1 text-fig. Linköping 1956.

Various investigations into the humus content of the soil on different conditions are reported, and the importance of investigations about the influence of animal-free farming and of successions of crops fitted for it on the humus state of the soil is emphasized. *WL.*

TORSTENSSON, G.: Växtföljden och jordens humustillstånd [The succession of crops and the humus condition of the soil]. — Sv. Lantarbetsgivareføren. Tidskr., 1957, A, pp. 13—17, 6 text-figs. Stockholm 1957.

The significance of the humus content for different soils, its decline at cultivation, particularly at animal-free farming, and the succession of crops, especially the preservation of pastures, as a soil-conservating factor are emphasized. *WL.*

TORSTENSSON, G. & FIEDLER, H. J.: Undersökningar över Krilium och andra strukturstabilisatorer [Investigations of krilium and other soil aggregate stabilizers]. — NJF, 38, pp. 279—282. Disc. Aslyng, ibid., p. 282. Uppsala 1956.

Some synthetic soil aggregate stabilizers of four chemical groups occurring in the market have been investigated. Such soil conditioners have a favourable effect on the soil structure by increasing the aggregate formation. They are still too expensive, however, for practical use. — Disc. (Aslyng): In Denmark experiments have been carried out with the preparations krilium and flotal in marsh soils. The latter gave the best result. In soils with a high content of lime flotal may be of importance for the supply of manganese. *EM.*

TORSTENSSON, G. & JOHANSSON, OLLE: Undersökningar av rensningsslam från avloppskanal [Investigations of soil materials from re-digging of a drain canal]. — Grundförbättring, 9, pp. 24—37, 6 text-figs. English summary p. 53. Uppsala 1956.

TORSTENSSON, G., NILSSON, NILS M. & FIEDLER, H. J.: Untersuchungen über Bodenstrukturverbesserungsmittel. I. Wirkungsdauer verschiedener Präparate [Investigations on soil aggregate stabilizers. I. Duration of action of different preparations]. — KLA, 23, pp. 323—341, 5 text-figs. Uppsala 1957.

TROEDSSON, TRYGGVE: Bidrag till kännedom om ytavrinningens omfattning i skogsmarken [Contribution to the knowledge of the extent of run-off in forest soils]. — SST, 55, pp. 515—522, 5 text-figs. Norrtälje 1957.

Preliminary results of experiments to measure the run-off. According to the author run-off water means water running off over the surface or in the superficial layers where most of the roots are. The run-off in normal Swedish forest soils (glacial till) is of great importance. *HM.*

TROEDSSON, T.: Den västtyska ståndortskarteringen och dess användbarhet under svenska förhållanden [The West German mapping of forest sites and its fitness for use under Swedish conditions]. — SST, 54, pp. 11—21. Norrtälje 1956.

An account of the mapping of forest sites in Germany, which is a comprehensive mapping of the forest soil with thorough observations of geological, climatological, hydrological, and plant sociological conditions. According to the author, an application of the main features could be of great value at least in certain parts of South Sweden. *HM.*

TROEDSSON, TRYGGVE: Kritik av »en kritisk analys» [Critique of »a critical analysis»]. — Grundförbättring, 9, pp. 38—45. English summary p. 53. Uppsala 1956.

TROEDSSON, TRYGGVE: Marktemperaturen i ytsteniga jordarter [Soil temperatures in moraines with stony surface layers]. — K. Skogshögsk. Skr., 25, 22 pp., 4 text-figs. English summary p. 21. Stockholm 1956.

UGGLA, EVALD: Mark- och lufttemperaturer vid hyggesbränning samt eldens inverkan på vegetation och humus [Soil and air temperatures during controlled burning and effect of the fire on vegetation and humus cover]. — Norrl. Skogsvårdsförb. Tidskr. f. år 1957, pp. 443—500, 20 text-figs. English summary pp. 485—495. Stockholm 1957.

VAHTRAS, KAAREL: Forms of phosphate in Swedish soils and their availability to plants. — KLA, 22, pp. 147—177, 12 text-figs. Uppsala 1956.

VUORINEN, JOUKO: Finska undersökningar rörande Mn, Cu och B [Investigations in Finland concerning Mn, Cu, and B]. — NJF, 38, pp. 199—208, 4 text-figs. Disc. Svanberg, ibid., pp. 208—209. Uppsala 1956.

In this summary of investigations by O. Mäkitie, A. Tainio, P. Hänninen, and the author it is stated that long continued exploitation of the soil has led to impoverishment in minor elements. In Finland there are areas with deficiency in copper and boron and the crop yields have increased considerably after application of these elements. — Disc. (Svanberg): In soils with copper deficiency in South Sweden there is reason to be on guard against its reducing effects on the yields of cereals. Boron deficiency deteriorates the seed-formation of clover but during dry years it may also be unfavourable to the cultivation of sugar beets and the clover growth for hay. *EM.*

WALLIN, BROR (B. W.): Termer och benämningar ang. organogena jordar [Terms and names for organogenic soils]. — BVM, 9, p. 11. Uppsala 1957.

Discussion of the terms mosse (bog) and kärr (fen). *WL.*

WEBER, ANNA: Flerårige magnesiumforsøg [Experiments with magnesium over several years]. — NJF, 38, pp. 224—228. Disc. Jensen, ibid., p. 232. Uppsala 1956.

Magnesium deficiency was noticed in Denmark in 1946, which led to a series of experiments with application of magnesium, partly as sprays and partly to the soil directly. In acid sandy soils liming may remedy magnesium deficiency but it has no effect in humus soils with a high potassium content and basic reaction. — Disc. (Jensen): Determinations of magnesium in Danish soils have shown that soils with pH 7.5—8.0 contain biological magnesium which is not exchangeable. *EM.*

WENNERSTRÖM, SVEN: De värmländska åkerjordarnas näringsinnehåll och gödslingsbehov [The nutrient content and need of fertilizing in the cultivated soils of Värmland]. — Värml. Läns Hushållningssällsk. Årsber. 1956, pp. 165—175, 3 text-figs. Karlstad 1957.

The phosphate state in the cultivated soils of Värmland is weak, the potassium state tolerably satisfactory, and the lime content relatively low. *WL.*

WESTERMARCK, NILS: Jordbrukets naturliga förutsättningar i Norden [The natural conditions of farming in Scandinavia]. — Lantbrukets driftsekonomi, LT:s Förl., pp. 73—110, 15 text-figs. Stockholm 1956.

Contains *i. a.* a brief account of bedrock and soils as well as a subdivision into natural agricultural districts. *WL.*

WIKLANDER, LAMBERT: Lerfraktionens mineralogiska sammansättning och fysikalisk-kemiska egenskaper [Mineralogical composition and physico-chemical properties of the clay fraction]. — NJF, 38, pp. 295—298, 1 text-fig. Uppsala 1956.

Regional studies of the mineralogical composition of the clay fraction show that illite is the main mineral in most of the clays investigated. Quartz and kaolinite generally occur in small amounts and further chlorite, vermiculite, feldspar, and amphibole are found. Montmorillonite occurs in the South-East and South-West moraines of Scania and only there. Among other results may be mentioned that the content of clay particles less than 0.5 μ is lowest in Glacial and Post-Glacial clays and highest in the South-West moraine. *EM.*

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Recensioner

Radim Kettner: Allgemeine Geologie III. Die äusseren, geologischen Kräfte, die geologische Tätigkeit des Wasser. — VEB Deutscher Verlag der Wissenschaften, XIII + 460 sid., 318 textfig. 1 pl. Berlin 1959.

Tredje bandet av Radim Kettners lärobok i allmän geologi har nu utkommit i tysk översättning. I detta ges en utförlig skildring av vattnet och dess geologiska verksamhet samt av de rådande biologiska och fysikaliska förhållandena i olika typer av vatten. Skildringen är ytterst allsidig men i någon mån präglad av de geologiska förhållandena på kontinenten. Sålunda har t. ex. karstfenomenen ägnats ett proportionsvis mycket stort utrymme, medan framför allt sjöarna och deras geologi kommit något i skymundan. Särskilt gäller detta vid jämförelse med kapitlet om havet. Beskrivningen av sjöarna är huvudsakligen morfologisk. I kapitlets ingress påpekas, att den vetenskap som sysslar med sjöarnas utforskning benämnes limnologi, men vad vi i dagligt tal menar med limnologi saknas nästan helt i denna bok. Limnologien faller väl visserligen något utanför bokens ämne men då havets biologi ägnats relativt stort utrymme skulle man nog önskat åtminstone en översiktlig redogörelse även för sjöarnas biologi.

I övrigt gäller samma omdöme om det nu föreliggande bandet som redan givits i anmälningen av de båda föregående (i band 81 av Förhandlingarna). Boken är alltså synnerligen utförlig och väl lämpad som uppslagsverk. I ett avseende märker man emellertid en påtaglig förbättring: Illustrationerna är genomgående av högre klass än i de första banden. Delvis sammanhänger väl detta med att författarens egna, ofta dåliga fotografier nu starkt reducerats till antalet. Då boken är mycket rikt illustrerad, blir därför även det yttre intrycket nu på det hela taget gott.

Jan Lundqvist

Methods in Geochemistry. Edited by *A. A. Smales* and *L. R. Wager.* Interscience Publishers, New York, London, 1960. 464 sid. Pris Kr 81: 55.

Boken är ett symposium och indelad i elva kapitel. Det första kapitlet är en introduktion av de båda utgivarna, de två välkända brittiska forskarna A. A. Smales, ledande kemist i Atomic Energy Research Establishment i Harwell och L. R. Wager, professor i mineralogi och geologi i universitetet i Oxford. Häri får man en överblick över de geokemiska problemen och de moderna analytiska möjligheterna att penetrera dem.

Wager är tillika en av författarna till kapitel två, som omfattar det viktiga och ofta försummade arbetet med provtagning och provberedning. Några sidor ha ägnats olika separationsmetoder, bl. a. med isodynamiska mineralseparatorer och s. k. superpanners. I kapitlen 3—10 beskrivas de olika analysmetoderna: konventionella kemiska analysmetoder inklusive flamfotometri och kolorimetri. Vidare optisk, röntgen- och masspektrometri, radiokemiska och aktiveringsanalyser samt polarografi. Kapitel elva slutligen är en beskrivning av kemiska separerings- och anrikningsmetoder. Till varje kapitel finns ett författarregister.

Framställningen av de olika kapitlen har anförtrotts specialister från Harwell och Oxford och den bygger på ett mångårigt samarbete mellan de båda nämnda forskningscentra. Detta har åt framställningen givit stadga och enhetlighet, utan att därför skada de medverkande författarnas individualitet. Vidare har härigenom undvikits onödiga upprepningar i framställningen av varandra närliggande områden.

Givetvis finns det i detta första försök till en allsidig orientering i ett så mångsidigt och heterogent verksamhetsfält som heter geokemisk undersökningsmetodik luckor och ojämnheter i framställningen. Den omständigheten att författarna alla tillhöra en geografiskt begränsad forskargrupp har sina förut omnämnda fördelar, men det kan också bliva till hinders för nödvändiga utblickar mot den övriga världen. Således kan man påträffa ofta besvärande luckor i annars välskrivna kapitel och referentlistorna sakna några för den geokemiska undersökningsmetodikens utformning viktiga data. Några få exempel. I kapitel 4, som beskriver den spektrokemiska analysen, ha författarna underlåtit att nämna några mycket väsentliga förbättringar och nya metoder, bl. a. den i ett flertal institutioner alltmera tillämpade tekniken med elektronisk registrering av spektrallinjeintensiteterna — andra smärre inadvertenser i detta i övrigt intressanta kapitel att förtiga. I kapitel 6, som behandlar de stabila isotopernas geokemi och den masspektrometriska analystekniken borde beskrivningen av den så ytterst viktiga provberedningen beretts större utrymme än vad som nu är fallet.

Emellertid väga de nu nämnda och andra smärre brister i framställningen lätt mot de otvivelaktiga förtjänsterna i detta förstlingsverk i genren. En dylik orientering i den geokemiska undersökningsmetodiken har länge varit önskad och boken utgör ett värdefullt tillskott till den icke alltför rikhaltiga litteraturen på området.

I förordet uttala utgivarna den förhoppningen, att arbetet skall väcka intresse hos de kemister och geologer, som arbeta i eller ha sina blickar riktade mot det fascinerande forskningsfält, som heter geokemi. Man önskar livligt att denna förhoppning skall gå i uppfyllelse. De påtalade skönhetsfläckarna kunna lätt försvinna i kommande upplagor.

Sture Landergren

A. Rittmann: Vulkane und ihre Tätigkeit. Andra omarbetade och och utökade upplagan, innehållande 113 bilder, två tavlor och VII + 340 sidor. Ferdinand Enkes förlag, Stuttgart 1960. Pris häftad DM 49.50 och i hellinneband DM 53.00.

24 år och ett världskrig har förflutit sedan professor Rittmanns lärobok i vulkanologi första gången kom ut (1936). Boken var då icke alls så omfattande som nu och tilldrog sig heller icke någon större uppmärksamhet. Betydligt mera känd blev den utökade italienska upplaga, som trycktes år 1944.

Vad som omedelbart tilltalar i Rittmanns bok sådan den nu föreligger — första upplagan har jag ej trängt närmare in i — är den av termpetitesser och förkonstlade klassifikationer obundna, objektivt och utförligt beskrivande texten. Olika slag av vulkanisk verksamhet beskrivs i bokens första avsnitt, och såväl talrika exempel som instruktiva bilder får belysa de skeenden författaren tar upp till behandling.

Bokens andra avsnitt skildrar de vulkaniska utbrottsprodukterna. Här tar författaren bestämt avstånd från de konstlade system för klassifikation av vulkaniska bergarter, som tid efter annan dykt upp och villigt anammats. C.I.P.W.-systemets tillämpning på vulkaniter, t. ex., tilltalar inte Rittmann (s. 109).

Tredje avsnittet av boken tar vulkanernas form och byggnad i betraktande, och därefter skärskådas vulkanernas geografiska utbredning.

Med ett femte avsnitt betitlat vulkanism och tektonik tar Rittmann för en stund avsked av den egentliga vulkanologin. Han går i de sjätte och sjunde avsnitten in på magmorna och deras egenskaper. Han kommer där småningom i beröring med problemet regionalmetamorfos och vad Sederholm kallade anatexis, undviker dock de mera pittoreska utsvävningar, som mångenstädes är på modet inom petrologin, och ansluter sig vad gäller granitisering i stort till Wegmanns hypotes om en uppstigande migmatitfront (s. 224).

I det åttonde avsnittet tar Rittmann upp den vulkaniska utbrottsmekanismen till en mera allmän behandling för att i det nionde avsnittet diskutera vulkanismens förhållande till orogenes och epirogenes. Det tionde och sista avsnittet är till sin karaktär allmänt och vittutsvävande, så som redan dess titel, vulkanismens väsen, anger. Problem sådana som jordens ursprung och de primära magmornas bildning behandlas här, och följdriktigt kommer författaren i detta sammanhang småningom även in på meteoriternas uppkomst.

Registren som avslutar boken är utförliga, men en stor vinning skulle det ha varit, om huvudbeskrivningen av en företeelse, en vulkan e. d., markerats medelst kursivering eller förgrovning av sidhänvisningssiffrorna. Nu har man t. ex. sex hänvisningar för Havajiöarna att välja mellan och vet inte, var man ska slå upp för att få läsa det väsentliga.

Stavningen av ord är inte alltid konsekvent. Sålunda finner man på s. 56 Bogoslowöarna men på s. 84 Bogoslowsk-öarna.

Men sådant är lappri när det gäller en bra bok, och det är vad man som slutomdöme har att säga om Rittmanns verk sådant det nu föreligger. (Första upplagan har jag som nämnt ej studerat närmare.) Det bör kunna läsas av en var med intresse för vulkaner, tillämpliga delar även av icke-fackmannen. Man får t. o. m. anvisningar om så praktiska ting som hur man ska skydda sig vid vulkanutbrott och hur man ska kunna hindra lavaströmmar från att förstöra bebyggelse.

Per Lundegårdh

R. Brinkmann: Geologic evolution of Europe. Translated from the German by John E. Sanders. Ferdinand Enke Verlag Stuttgart 1960. 161 s., 46 textfig., 19 pl. 18 tab.

Av titeln får man närmast den föreställningen, att här föreligger ett nytt verk, men när man slår upp boken finner man, att den — med mycket obetydliga ändringar — är en översättning av de delar i Brinkmanns »Abriss der Geologie» (bd 2, 8. uppl., 1959), som hänför sig till Europa. Arbetet är avsett att finna användning som lärobok inom det anglosaxiska språkområdet och bör som sådan otvivelaktigt ha en uppgift att fylla. Närmast motsvarande engelskspråkiga arbeten, av vilka det finns ett rikt sortiment av amerikanskt ursprung, ägnar ju mycket ringa, om något, utrymme åt europeiska förhållanden. Brinkmanns »Abriss», å andra sidan, ger visserligen breda utblickar över den geologiska utvecklingen inom alla kontinenter men har avgjort tyngdpunkten förlagd till Europa. Någon av de amerikanska läroböckerna ger därför i kombination med »Geologic evolution of Europe» en god översikt över Nordamerikas resp. Europas geologi, även om vad sistnämnda beträffar med viss tonvikt på Tyskland och övriga Mellaneuropa. En skandinavisk läsare finner nog de nordiska länderna något styvmoderligt behandlade, kanske särskilt beträffande mesozoikum, varom man inte får veta just någonting.

Brinkmanns »Abriss» har tidigare anmälts i GFF (bd 81, 1959, s. 551). Vad som då anfördes har givetvis tillämpning även på föreliggande arbete. En del onöjaktigheter torde oundvikligen ha insmugit sig vid översättningen. Ett exempel på sådant är den tyska originaltextens »Polnisches Mittelgebirge», som i den engelska upplagan blivit till »Svientokrzyz Hills» (alternativt Ranges el. Mountains). Detta är en mindre lyckad polsk-engelsk hybrid, särskilt som det första ledet är felaktigt. Bäst hade väl varit i detta sammanhang att använda den gängse engelska benämningen »Holy Cross Mountains» eller också den polska namnformen »Góry Swiętokrzyskie».

En felaktig uppgift, som inte påtalades då »Abriss» anmäldes, kan förtjäna att omnämnas. Termen »Gotlandium» resp. »Gotlandian» (s. 27) föreslogs ej av Lapworth, 1879. Auktor är de Lapparent, 1900 (»Gotlandien»). Sökandet efter direkta sakfel ger annars dåligt utbyte. Att skilda läsare kan ha olika uppfattning om den lämpliga avvägningen av stoffet är emellertid självklart. Detta gäller inte minst de kortfattade översikterna över olika forskares bidrag till utvecklingen inom skilda länder, som inte alltid är helt representativa. På det hela taget är det emellertid väl motiverat att om denna bok upprepa det fördelaktiga omdöme, som tidigare givits om »Abriss der Geologie».

G. Regnéll

C. O. Dunbar: Historical Geology. 2nd ed. John Wiley & Sons, Inc. New York, London 1960. 500 + IX s., fig. 1—406 + ett antal onumrerade fig.

Första upplagan av Dunbar's »Historical Geology» utkom 1949. Boken hade emellertid redan då en befäst tradition, i det att den var en nybearbetning av »Historical Geology» utgörande del 2 av »A Textbook of Geology» av Schuchert och Dunbar. Denna publicerades ursprungligen 1915, då med L. V. Pirsson som Schucherts medförfattare. Verket torde därmed vara ett av de tidigaste i sitt slag och har otvivelaktigt delvis tjänat som förebild för de många sinsemellan ganska likartade läroböcker i historisk geologi, som utkommit i USA.

Inga större förändringar har företagits i dispositionen av den nya upplagan, men mycket nytt stoff har tillkommit. Åtskilliga kapitel har helt nyskrivits, varigenom framställningen på det hela taget aktualiserats så långt man rimligtvis kan begära. Om sedan läsaren skulle råka få den uppfattningen, att praktiskt taget intet geologiskt skeende utspelats utanför den nordamerikanska kontinenten och att så gott som uteslutande amerikanska forskare bidragit till att klargöra jordens historia, beror detta på att Dunbar — i likhet med större delen av sina läroboksförfattande landsmän — tydligen menar, att amerikanarna i detta hänseende kan vara sig själv nog. Ståndpunkten kan försvaras med att det inhemska materialet är helt överväldigande både kvantitativt och kvalitativt, men en europeisk läsare kan icke bli tillfredsställd med de knappa och sporadiska upplysningarna om utomamerikanska förhållanden.

I enlighet med en genomgående tendens har bokens format ökats till fördel för illustrationerna. Illustreringen är av högsta klass och slösande rik — man kan ibland vara frestad att kalla den slösaktig. Åtskilliga bilder, särskilt av berggrundsskärningar kan förefalla en smula onödiga. Man finner flera exempel på att helt identiska bilder förekommer i olika reproduktionsskala. En figur sådan som den å sid. 213, som upptar betydligt mer än hälften av textsidan och som utan någon detaljskärpa visar 27 exemplar av *Pentremites,* är knappast lyckligt vald. Ett upplivande inslag är de många rekonstruktionsbilderna efter skilda originalframställningar. Någon gång speglar de kanske inte allra senaste uppfattning, såsom i fråga om *Pharyngolepis* (fig. 136), där Kiaers rekonstruktion borde ha ersatts med den som gjorts av Stensiö och som återfinns bl. a. i Traité de Zoologie (1958). Onödigt många tryckfel har insmugit sig i bildtexterna. Av någon anledning har de främst drabbat växtnamn (fig. 137, *Baragwakathia* i st. f. *Baragwanathia;* fig. 165, *Protolepidodeudron* i st. f. *Protolepidodendron;* fig. 166, *Hornae* i st. f. *Hornea,* ett namn som f. ö. i egenskap av homonym skall ersättas med *Horneophyton*). *Trachodon* har på flera ställen kommit att heta *Trachydon.* von Koenigswald kallas i texten till fig. 383 Von Koenigswalk. *Pithecanthropus* (alias *Sinanthropus*) *pekinensis* skrives på flera ställen oriktigt som *pekingensis.* Vid utgrävningarna utanför Peking hittade Birger Bohlin den första tanden 1927, varför det inte är alldeles korrekt att säga (s. 447), att pekingmänniskan kom i dagen genom fynd 1928 och 1929; dessutom har utgrävningarna fortsatt och lämnat nya fynd. Allt det anförda är emellertid att betrakta som missöden och ej som misstag. Ett påstående (s. 425), mot vilket man gör klokast i att förhålla sig avvaktande, är, att *Oreopithecus* med full tillförsikt kan placeras in i den linje, som direkt leder till människan. Självfallet är, att man på åtskilliga punkter kanske velat se en något annan formulering än den givna, men detta förtar på intet sätt det goda helhetsintrycket av boken.

G. Regnéll

Mötet den 6 oktober 1960

Närvarande 33 personer.

Ordföranden, hr Asklund, öppnade sammanträdet och meddelade följande:

Den 3 november 1959 avled i Warschawa professor Jan Samsonowicz, sedan 1935 en av vår förenings korresponderande ledamöter. Han var född 1888 och blev efter studier i S:t Petersburg anställd vid universitetet i Warschawa och Polens geologiska undersökning samt sedermera professor vid universitetet i Lwow. Efter andra världskrigets slut blev det hans uppgift att reorganisera det totalförstörda Warschawauniversitetets geologiska institut och i övrigt återställa undervisningen i ämnet samt igångsätta den vetenskapliga verksamheten, bland annat inom polska vetenskapsakademien som redaktör för Acta Geologica Polonica, allt uppgifter som medförde livligt erkännande och uppskattning. Hans vetenskapliga produktion behandlar väsentligen Polens paleozooiska och mesozooiska bildningar, deras stratigrafi och paleontologi. Hans arbeten ledde även till upptäckten av exploaterbara fyndigheter, bl. a. järnmalms- och fosforitfyndigheter. Han ledde också djupborrningsarbeten av stor betydelse (i Volhynic och Bug-området). — Samsonowicz var en stor patriot och säges ha varit en ovärderlig lärare.

Den 20 april i år avled bruksdisponenten William Patrik Nisser, Korsnäs. Han var född 1882 och blev medlem i Föreningen 1905. Nisser var en känd industriman, som vid sidan av sin förnämsta insats, den som disponent för Grycksbo pappersbruk, fann tid över för vidsträckt verksamhet inom Dalarnas näringsliv, särskilt dess skogs- och jordbruk. Han var ledamot av Skogs- och Lantbruksakademien och hedersledamot av hemlänets hushållningssällskap. I Uppsala blev han fil. kand. 1908 och tillhörde A. G. Högboms elevkrets.

Jag lyser frid över de bortgångnas minne!

Hr Thorslund har begärt och erhållit entledigande från sin post som ledamot i Föreningens redaktionskommitté, och styrelsen uttalar sitt varma tack till hr Thorslund för allt det arbete han utfört under de gångna åren.

Till ledamöter av Föreningen har styrelsen invalt: ingenjör Rolf Bergström, Vällingby, och bergsingenjör Herbert Boye, Stockholm, båda föreslagna av hr Meier; bibliotekarie Alf Kåre, Stockholm, föreslagen av hrr Hessland och Åhman; fil. stud. Staffan Modig, Uppsala, föreslagen av hrr K. Nilsson och Åhman; ingenjör Björn Nylund, Kiruna, föreslagen av hrr Ekström och De Geer och slutligen överingenjör Björn Romson, Stockholm, föreslagen av hrr Wenner och N. Mårtensson.

Professor P. Thorslund har uppvaktats med telegram på sin 60-årsdag den 22 augusti. Tackskrivelse har ingått.

Cirkulär nr 1 rörande International Symposium on Agglomeration i Philadelphia, Penn., U. S. A., den 12—14 april 1961 har kommit Föreningen tillhanda. Närmare upplysningar lämnas av sekreteraren.

Ordet överlämnades därefter till hrr F. Brotzen och I. Hessland vilka höllo föredrag över ämnet: Geologisk forskningsverksamhet i Polen. Konferens- och exkursionsintryck.

Efter föredragen visade hr Brotzen sin filmupptagning från Polen. I anledning av föredragen yttrade sig Föreningens ordförande samt föredragshållarna.

Mötet den 3 november 1960

Närvarande 32 personer.

Ordföranden, hr Asklund, förklarade sammanträdet öppnat och meddelade följande:

Den 23 oktober avled i Uppsala Föreningens ledamot, geografen professor emeritus John Frödin i en ålder av 81 år. Han var född och studerade i Uppsala samt återbördades dit från Lund som professor i geografi år 1929. Frödin var ursprungligen snarast geolog med inriktning åt geomorfologien, varom hans gradualavhandling »Geografiska studier i Stora Lule älvs källområde» bär vittne. Intressena vidgades även åt botaniken, berörande särskilt våra fjälltrakter, för att så småningom förskjutas åt bebyggelsegeografin. Han har gjort en mycket omfattande insats för utforskandet av fäbodväsendet i Sverige och även i Alperna och Pyrenéerna samt bebyggelseförhållandena i Marocko och Sahara. Han framhålles ha särskilt väl lyckats att se och analysera växelverkan mellan natur och kultur. Han blev ledamot i Föreningen år 1910.

Den 29 oktober avled geologen och arkeologen, professor Johan Gunnar Andersson i en ålder av 86 år. Han var född i Knista i Närke och han behöll genom hela livet ett stort intresse för detta sitt landskap, där han kom att göra sina tidigaste geologiska lärospån. Han utgav år 1895—96 den kända avhandlingen »Über cambrische und silurische phosphoritführende Gesteine aus Schweden», spännande över Södra Sverige upp till Dalarna. Det skulle här bli alldeles för mycket att söka lämna en även kortfattad redogörelse för *Anderssons* mångskiftande insatser i geologi i vidaste bemärkelse, paleontologi, arkeologi, antropologi och kulturhistoria, varför jag inskränker mig till några huvuddrag. Den arktiska forskningen infördes han uti av Nathorst på Spetsbergen 1898. Året därpå gjorde han en egen expedition till Björnön, vars stratigrafi och tektonik belystes i gradualavhandlingen år 1901. Därpå följde hans deltagande i Otto Nordenskjölds sydpolsexpedition 1901—1903 såsom Nordenskjölds närmaste man, varvid han även besökte Falklandsöarna och Eldslandet, och han var chef på den andra expeditionen. Efter Törnebohm blev han 1906 chef för Sveriges Geologiska Undersökning med titeln professor och efter omorganisationen 1914 överdirektör. Han var den främsta kraften vid ämbetsverkets omorganisation, en mycket betydande insats som belyste hans stora administrativa förmåga. Stugan blev honom ånyo trång och 1914 mottog han kinesiska regeringens uppdrag att leda de malmgeologiska undersökningarna i Kina. Det ursprungliga uppdraget förvandlades snart till djupgående och utomordentliga utforskningar av Kinas arkeologi, antropologi och paleontologi, på grundval av en mängd lyckosamma fynd.

År 1925 kallades *Andersson* efter Gerard De Geer till professuren i geologi vid Stockholms Högskola, men lämnade denna redan år 1926, varefter så småningom han blev föreståndare för de östasiatiska samlingarna i Stockholm och erhöll en personlig professur i östasiatisk arkeologi, från vilken han avgick med pension år 1939.

I geologernas minne kommer *Johan Gunnar Andersson* särskilt att bevaras genom sin insats för Sveriges Geologiska Undersöknings omorganisation och det utomordentliga sätt på vilket han organiserade den internationella geologkongressen i Stockholm år 1910 i egenskap av dess generalsekreterare. För den större allmänheten framstår han såsom »Kina-Gunnar», som i hög grad populariserade kunskapen om Kina i vårt land och vars mångahanda forskningsresultat från det stora landet haft, ha och komma att få den största vetenskapliga betydelse. En mängd populärvetenskapliga skrifter vittna om hans intresse att levandegöra sina forskningar för den bredaste allmänhet och många äro väl de svenskar som i likhet med talaren erinra sig hans oförlikneliga förmåga att i populärföreläsningens form bringa sina åhörare en fläkt från de stora äventyrens värld. En sällsynt färgstark geolog har med Johan Gunnar Andersson lämnat vår krets efter ett 69-årigt medlemskap i vår förening.

Jag lyser frid över de bortgångnas minne.

Till ledamöter av Föreningen har styrelsen invalt statsgeologerna Knut Bryn och Audun Hjelle, Oslo, föreslagna av hrr N. H. Magnusson och E. Fromm; ingenjör N. Lundgren, Stockholm, föreslagen av hr O. Gabrielsson; bergsingenjör Bertil Isaksson, Gästrike-Långnäs, föreslagen av hrr P. H. Lundegårdh och G. Lundqvist; geolog Valerij Torov, Johanneshov, föreslagen av hrr G. Ekström och K. Nilsson; amanuens

Björn Neuman, föreslagen av hr P. Thorslund samt bergsingenjör Ingemar Lager, Stockholm, föreslagen av hrr O. H. Ödman och Å. Henriques.

Styrelsen har vid sammanträde i dag beslutat föreslå Föreningen en ändring av stadgarnas § 6 mom. 2 så, att antalet korresponderande ledamöter utökas från 20 till 25. Som motivering har anförts, att dels har antalet geologer i världen ökat starkt de sista decennierna och dels har Föreningen ökat mycket i medlemsantal efter det att bestämmelsen om begränsningen av antalet korresponderande ledamöter till 20 tillkom. — Stadgeändringsförslaget bordlades utan diskussion till nästkommande sammanträde.

Efter ett hälsningsanförande överlämnade hr ordföranden ordet till professor Marshall Kay vid Columbia University i New York, som höll ett föredrag med titeln: Paleozoic Rocks in the Thrust Nappes in Nevada, Western U. S. A. Ett sammandrag följer här nedan.

The North American Cordillera includes the mountains lying between the Great Plains and the Pacific Ocean. Relative to Palaeozoic tectonics, the region is in the western part of the craton, and in the miogeosynclinal and eugeosynclinal belts. Conventionally the Rocky Mountains are considered to be Laramides (late Cretaceous-early Tertiary), the Basin Ranges to be Nevadides (mid-Mesozoic) with Tertiary block-faulting, and the coastal mountains to be Tertiary. The speaker concerned himself with the stratigraphic and structural relations in the Palaeozoic rocks in Basin Ranges in central Nevada, where the Palaeozoic eugeosynclinal and miogeosynclinal belts are in a succession of nappes, and particularly with the Toquima Range near the center of the state. Nevada has an area of nearly 300 000 square kilometers, two-thirds that of Sweden, but a length of about 900 kilometers, little more than half that of Sweden.

The Ordovician to lowest Devonian rocks in the Toquima Range are in several stratigraphic sequences separated by thrust faults, as described in the paper in Section 12 of the Copenhagen Congress. The lowest and eastern sequences are similar to the carbonate and orthoquartzite sections in the miogeosyncline of eastern Nevada. An upper sequence has some 1 000 meters of Ordovician chert and argillite, with lesser lavas, limestones and orthoquartzites, dated by graptolites in several zones. Stratigraphic restoration shows that the lower Ordovician rocks pass by gradation from the carbonate to the chert-argillite facies. On the other hand, Silurian rocks thin westward, and then thicken again, the base being high Ludlovian in central sequences. A narrow island belt was along the miogeosynclinal border during the Silurian period.

In a band more than 600 kilometers long, from southwest of Tonopah to the northeast corner of the state, the easternmost remnants of the allochthone of chert-argillite-volcanic rocks lie 80 kilometers southeast of the westernmost exposures of the equivalent carbonate facies — so the minimum displacement of the allochthone approaches 100 kilometers. The time of thrusting is uncertain for many thrusts. There are thrusts that cut Triassic and Jurassic, and a sequence of Ordovician through Carboniferous eugeosynclinal rocks in northern Nevada is thrust on Carboniferous limestones and sandstone unconformably overlying normal miogeosynclinal Cambrian. Hence some thrusts are definitely post-Carboniferous. Yet Carboniferous limestones in the Toquima Range lie unconformably on strongly folded Ordovician cherts, argillites and volcanic rocks, and in many ranges the Carboniferous and Permian east of the allochthone have thick conglomerates of chert pebbles eroded from eugeosynclinal rocks. Moreover, late Carboniferous lies with angular unconformity on early Carboniferous near Elko. So there definitely were Palaeozoic orogenies. In most cases it is not determinable whether a thrust is of this age, and whether the allochthone was displaced in the Palaeozoic. Tertiary block-faulting further complicates geologic maps — but also improves prospects of interpretation because rocks from several tectonic levels are brought near together in surface exposures.

The causes of movement are obscure, for it seems easier to raise objections to

hypotheses than suggest better ones. One cannot conceive of nappes of argillite and chert having been "pushed" for a hundred kilometers. But if the movement of the allochthone was Mesozoic, the lower Palaeozoic rocks would have to come from a region in which there are none exposed. Western Nevada is a synclinorium, from which Palaeozoic rocks could hardly have glided down to the eastward. Probably we are making unwarranted assumptions, for we have much to learn about the geology, and likely the structural history is quite complex.

There are many similarities to Scandinavian Caledonides. The Palaeozoic succession in the allochthone is quite like that around Trondheim, and in western Västerbotten and Lapland, though lacking an exposed crystalline floor such as in the Seve and Lower Jotun nappes. The allochthone cuts down over progressively lower nappes eastward in each region; in the Toquima Range the structures have quite different directions of trend. In Nevada the allochthone is thrust over a very broad miogeosynclinal belt, so there are many thousands of meters of sediments beneath its front. In Sweden, as in eastern North America, the miogeosynclinal belt is rather narrow, and the allochthone comes close to the crystalline floor on the cratonal border. The Scandinavian nappes have a hinterland of crystalline rocks, but in Nevada such rocks are hundreds of kilometers to the west. The problems of roots of thrusts and mechanics of displacement seem always to confront us. The lower thrusts in central Nevada have moved on argillaceous beds in the low Ordovician, and the upper and more westerly have glided on Cambrian strata. This is comparable to some of the lower Jämtland thrusts but seems unlike the higher allochthone in the Caledonides. The Nevada Palaeozoic structures have been further refolded and faulted, so that the thrust traces are extremely intricate as compared with those here — in fact, they are commonly concealed. Exposures are good in Nevada mountains, but Palaeozoic rocks are concealed in perhaps 90 per cent of the area by Tertiary and Pleistocene volcanic rocks, principally welded tuffs, and by the gravels of the intermontane basins. To a stratigraphic geologist, the Nevada structural elements give prospects of determining the original relations between the volcanic and non-volcanic geosynclinal belts. The two regions have many points of similarities and of difference, and are of unusual interest.

I anledning av föredraget yttrade sig hrr Bergquist, O. Brotzen, Hessland, föredragshållaren och ordföranden.

Geolognytt

Fil. lic. W. Uytenbogaardt har utnämnts till professor i mineralogi och petrologi vid Vrie Universiteit i Amsterdam.

Till bergmästare i Östra distriktet har utnämnts gruvingenjören i distriktet bergsingenjör N. G. R. Croneborg.

Bergmästaren i Norra distriktet, G. Fröman, Luleå, har beviljats avsked. Han efterträdes av bergsingenjör E. Knubb, Mossgruvan, Ljusnarsberg, vilken är utnämnd till bergmästare från den 1 maj 1961 och som tillträder sin befattning vid Bergsstaten den 1 jan. 1961.

Professor emeritus Olof Tamm har promoverats till hedersdoktor i skogsvetenskap av Humboldtuniversitetet i Berlin i samband med dess etthundrafemtioårsjubileum i november 1960.

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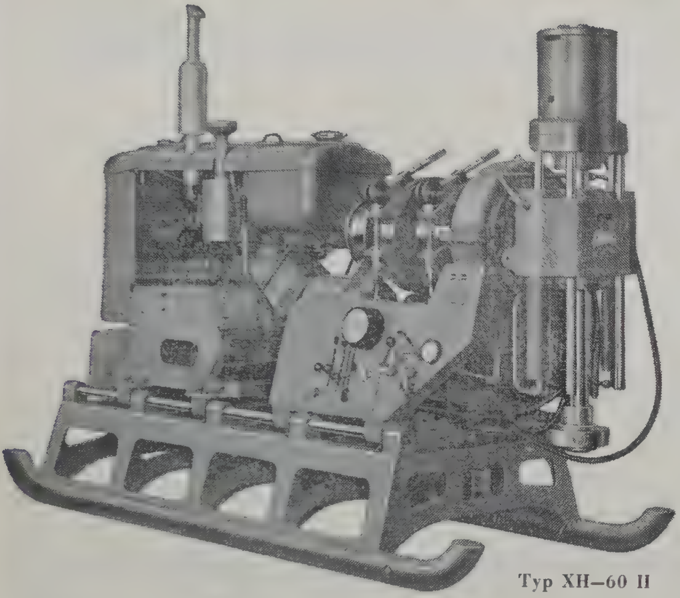

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